TRAUMA PROGRAM MANAGER MANUAL

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Forward

Hello and welcome to trauma coordination! You are joining an amazing group of highly dedicated nurses and medics across the state of Iowa. Trauma can impact any individual. Trauma (unintentional injury) is the fourth leading cause of death in the United States and is the leading cause of death in individuals 1-44 years of age. Iowa hospitals report the treatment of approximately 20,000 trauma patients per year. Iowa's top five causes of injury are typically: falls, motor vehicle incidents, being struck by or against objects, cuts and piercing, and incidents involving other land transport (ATV, snow mobiles, etc.). Incidents related to falls cause the most injuries. Motor vehicle associated incidents are typically the second highest cause of injury. The top three causes of death in Iowa are associated with falls, motor vehicles, and firearms. Over 200 people died due to trauma caused by falls in 2016 and 117 died in association with motor vehicle's collisions during the same year.

Such a wide scale issue cannot be solved by a single entity or discipline. Providing optimal care for injured patients must be managed from a systems approach. This approach needs to be inclusive of prevention and mitigation, provision of acute and definitive care, and rehabilitation. These approaches must be supported by data, evidence based practice, and research to be effective.

The Iowa Department of Public Health remains the lead agency responsible for the statewide trauma system. The Bureau of Emergency Medical Services oversaw the initial development of the trauma system. Currently, the Bureau of Emergency and Trauma Services (BETS) oversees the statewide trauma program, emergency medical services and providers, and public health and hospital emergency preparedness programs. BETS also provides support and technical assistance for those entities.

The BETS trauma program utilizes the *Resources for the Optimal Care of the Injured Patient 2014* as the standard for trauma verification criteria. The American College of Surgeons Committee on Trauma are national experts in providing high quality trauma care and, as such, BETS utilizes guidance from the College to support the direction and substance of the statewide trauma program.

As a Trauma Program Manager you are a crucial part of the quality of trauma care injured patients receive in Iowa. The program that you build will be integral to ensuring optimal care is received by injured Iowans across the state. A critical aspect of your role is the continual analysis of trauma events at your facility, the creation of action plans, and ensuring event resolution, along with coordinating the re-verification process for your facility.

As a trauma program manager you have taken on great responsibility, but you are supported by entities across the state to help you be successful. We look forward to working with you to ensure the optimal care of injured patients in Iowa.

Sincerely,

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Disclaimer:

This manual is not intended to replace the individual trauma center's orientation process. This manual is intended to provide the Trauma Program Manager, who is new to the role, helpful tools in understanding their role and how to successfully develop a hospital trauma program.

Table of Contents

Contents

Table of Contents 2
Introduction to the Trauma System 3
Core Job Responsibilities 5
Clinical Activities 6
Education Responsibilities 8
Performance Improvement 9
Administration 17
Supervision of the Trauma Registry 18
Consultant and Liaison 22
Research 23
Community and National Involvement in Trauma Care Systems 24
Hospital Verification 25
The Re-Verification Process 25
On-site Reviews 26
Paper Reviews 27
Disciplinary Action 27
Administrative Rules 29
Trauma Center Verification Criteria 30

Introduction to the Trauma System

Trauma Center History

Trauma Care has evolved into a specialty in many local and regional hospitals over recent years. Historically called emergency rooms, trauma centers have established high quality, comprehensive medical services for patients. The public relies on trauma centers to provide quality care from initial injury to final disposition, whether at the local hospital or tertiary care center. Regardless of where the trauma program is located, it provides critical services in a timely manner to patients who often need lifesaving measures. As a Trauma Program Manager (TPM), it is a primary responsibility to ensure patients are receiving the best care possible. This is often accomplished by compilation and analysis of data, policy review, and continuous quality improvement initiatives. The following chapters will provide an overview of many aspects of trauma care and acts as a guide to help the TPM succeed in their role. TPM will be referenced throughout the manual and will be the collective title for the role.

Trauma Center Levels

The verification of trauma levels is important in qualifying what essential services are offered at a hospital. The Iowa Department of Public Health (IDPH) is responsible for the verification, or re-verification, of each Level III and IV hospital on a three-year cycle. Criteria from the American College of Surgeons Committee on Trauma (ACS-COT) is utilized to ensure consistent practice standards and available resources. Basic definitions of each trauma level are outlined below.

LEVEL I

Verified by the ACS-COT, a Level I Adult or Pediatric Trauma Center is a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level I Trauma Center is capable of providing total care for every aspect of injury – from prevention through rehabilitation.

- Key elements of a Level I Trauma Center include 24-hour in-house coverage by general surgeons, and prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, and critical care. Other capabilities include cardiac, hand, pediatric, microvascular surgery, and hemodialysis. The Level I Trauma Center provides leadership in prevention, public education, and continuing education of the trauma team members. The Level I Trauma Center is committed to continued improvement through a comprehensive quality assessment program and an organized research effort to help direct new innovations in trauma care.

LEVEL II

Verified by the ACS-COT, a Level II Adult or Pediatric Trauma Center is able to initiate definitive care for all injured patients.

- Key elements of a Level II Trauma Center include 24-hour immediate coverage by general surgeons, as well as coverage by the specialties of orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology and critical care. Tertiary care needs such as cardiac surgery, hemodialysis and microvascular surgery may be referred to a Level I Trauma Center. The Level II Trauma Center is

committed to trauma prevention and to continuing education of the trauma team members. The Level II Trauma Center is dedicated to continued improvement in trauma care through a comprehensive quality assessment program.

LEVEL III

Verified by either the ACS-COT or the Iowa Trauma System, a Level III Trauma Center has demonstrated the ability to provide prompt assessment, resuscitation, stabilization of injured patients and emergency operations.

- Key elements of a Level III Trauma Center include 24-hour immediate coverage by emergency medicine physicians and the prompt availability of general surgeons and anesthesiologists. The Level III program is dedicated to continued improvement in trauma care through a comprehensive quality assessment program. The Level III Trauma Center has demonstrated prompt transfer protocols for patients requiring more comprehensive care at a Level I or Level II Trauma Center. A Level III Trauma Center is committed to the continued education of the nursing and allied health personnel or the trauma team. It must be involved with prevention and must have an active outreach program for its referring communities. The Level III Trauma Center is also dedicated to improving trauma care through a comprehensive quality assessment program.

LEVEL IV

Verified by the Iowa Trauma System, a Level IV Trauma Center demonstrates the ability to provide Advanced Trauma Life Support (ATLS) prior to transfer of patients to a higher level trauma center.

- Key elements of a Level IV Trauma Center include basic emergency department facilities to implement ATLS protocols and 24-hour laboratory coverage. The Level IV Trauma Center has demonstrated prompt transfer protocols for patients requiring more comprehensive care at a definitive care facility. The Level IV center is committed to continued improvement of these trauma care activities through a formal quality assessment program. The Level IV center should be involved in prevention, outreach and education within its community.

Core Job Responsibilities

Optimally, the TPM has educational preparation and experience in the care of injured patients. The TPM is responsible for the development, implementation, and evaluation of the trauma program (American College of Surgeons Committee on Trauma [ACS-COT], 2014). Ideally, the TPM supervises any ancillary staff needed to fulfill the requirements of the trauma system. A written job description will help define the role responsibilities and outline authority for accomplishing the goals of the trauma program.

It is the role of the TPM to assume the day-to-day responsibilities for process and performance improvement activities as applied to nursing and other ancillary personnel and should assist the Trauma Medical Director (TMD) in carrying out the same functions for the physicians' (ACS-COT, 2014). The TPM and the TMD share the responsibility for the success of the trauma team. Like all partnerships, the TPM and TMD must support each other, share a common vision, and mutually respect each other and the members of their team. The TMD and TPM report to a different hierarchy, but both share the burden of ensuring high-quality trauma care. A clear delineation of roles and responsibilities is crucial from the outset. A trauma specific organization chart should clarify the hierarchy of the program. Boundaries, timelines, and working relationships need to be defined and discussed candidly. The logistics of accomplishing the work need to be honestly assessed and assigned. How the TMD and TPM work together as a team, who is accountable for what, and the best means of communicating (phone, email, in person-meetings) are important aspects of building the relationship.

Ideally, the TPM should be supported by the ranking administrative structure and have sufficient resources to accomplish the requirements of a highly functioning trauma system. This can include, but is not limited to, secretarial and clinical nursing personnel to help fulfill outreach, performance improvement, and discharge planning, registry staff, injury prevention coordinator, and trauma nurse clinicians' (ACS-COT, 2014). Administrative and budgetary support needed for the trauma program depends on the size of the hospital and the volume of trauma patients cared for by the facility.

The qualifications and activities the TPM should participate in, will be outlined in the subsequent chapters, but should include the following (ACS-COT, 2014):

- Clinical activities
- Education responsibilities
- Performance Improvement
- Administration
- Supervision of the trauma registry
- Consultant and liaison
- Research
- Community and national involvement in trauma care systems

Clinical Activities

According to the ACS-COT (2014), it is the role of the TPM to, "coordinate management across the continuum of trauma care, which includes the planning and implementation of clinical protocols and practice management guidelines, monitoring care of in-hospital patients, and serving as a resource for clinical practice" (p. 42).

Trauma protocols should be evaluated for content based on the individual facility's protocol review policy, but should be reviewed and updated within the last five years to assure compliance with national standards and practice updates. Practice management guidelines go hand-in-hand with protocol development. The guidelines should be evidence based. The goal of a practice management guideline is to decrease variation in practice by following established standards of care. Practice management guidelines can be clinical (i.e. massive transfusion protocol) or administrative (i.e. trauma on-call response time guidelines). Appropriate stakeholders should be consulted during the development of a practice management guideline, in order to assure compliance with the most up-to-date standards and to increase buy-in from providers. All practice management guidelines should be monitored for compliance and achievement of desired outcomes. This can be accomplished through the trauma program's performance improvement process.

An important take-away from this section is: DO NOT REINVENT THE WHEEL. Chances are, if the trauma care facility is in need of a practice management guideline other facilities have already developed something similar. Use available resources to find what others have developed and tailor it to the facility's needs. Resources available include, but are not limited to, the following examples:

- Level I or II trauma centers who are the facility's major referral centers
- The facility may belong to a healthcare system, contact the TPM at partnering facilities
- Several Professional Organizations share best practice guidelines on their websites
    - American College of Surgeons - www.facs.org
    - American College of Emergency Physicians - www.acep.org
    - Brain Trauma Foundation - www.braintrauma.org
    - Pediatric Trauma Society - www.pediatrictraumasociety.org
    - Eastern Association for the Surgery of Trauma – www.east.org
    - Western Trauma Association – www.westerntraumaassociation.org
- Listserv participation can also be helpful to posit questions to
    - Society of Trauma Nurses - www.traumanurses.org
    - Iowa Hospital Association – Iowa Trauma Coordinators - www.ihaonline.org
- Iowa Department of Public Heath State Trauma Program - https://idph.iowa.gov/BETS/Trauma

Other TPM duties may include monitoring care of in-hospital patients to assure ease of transition from pre-hospital care to discharge, including transfer to definitive care and/or rehabilitation. The smoother this process is at the facility, the better functioning the trauma program will be and the faster patients will travel through the trauma continuum on their road to recovery. The TPM may also serve as a resource for clinical

practice, including answering practice questions, educating staff, and widely distributing practice guideline updates to assure high-quality evidence based care is being followed by the trauma program.

The TPM should consider participation in the Emergency Room, Trauma Intensive Care Unit, and Trauma Medical-Surgical staff meetings. Participation in these meetings will provide visibility to the job duties of the TPM, provide a venue for information sharing, and provide a forum for education on trauma care. Becoming an active member of hospital committees that have a stake in trauma, will allow the TPM to build relationships with subject matter experts which, in turn, will strengthen the program through evidence based practice sharing and buy-in. Active participation in unit based committees will also provide the TPM with a resource for barriers to providing safe, effective care to trauma patients. It will be the work of the trauma program to help remove those barriers and work towards providing optimal care to the injured patient.

Education Responsibilities

According to the ACS-COT (2014), it is the role of the TPM to, "provide for intra-facility and regional professional staff development, participate in case review, implement practice guidelines, and direct community trauma education and prevention programs" (p. 43).

Intra-facility and regional professional staff development means reaching out to partners in the facility's surrounding area, including within the service area the facility belongs, to develop all members of the trauma team who may care for injured patients in the surrounding community. This includes EMS or pre-hospital personnel, flight crews, emergency room personnel, OR and in-patient nurses, as well as, laboratory and radiology staff members who play a vital role in the optimal care of the injured patient. Educational programs are available through definitive care facilities, the Iowa Department of Public Health, and professional organizations that support the professional development of trauma care providers. Examples include:

- Rural Trauma Team Development Course(RTTDC)
- Trauma Care after Resuscitation(TCAR)
- Trauma Nursing Core Course(TNCC)
- Trauma Certified Registered Nurse(TCRN)
- Trauma Outcomes and Performance Improvement Course(TOPIC)
- Advanced Trauma Life Support(ATLS)
- Advanced Trauma Care Nurse(ATCN)

Implementing practice guidelines, as previously discussed, should optimally be done in concert with stakeholders at the trauma care facility. Wide distribution of the change in practice, with clear explanations for the change, the evidence behind the change, and how patients will be better served by the practice change will contribute to buy-in from practitioners. It is up to the trauma program to decide the best way to disseminate the change in practice. Email, fliers, and unit meetings are just some ways in which practice guideline changes can be distributed.

Community trauma education and prevention programs can be a unique way in which the trauma care facility provides outreach to the surrounding community, using registry data and community needs as a foundation. For example, if the trauma care facility is noticing an uptick of pediatric ATV accidents without associated safety equipment usage, the TPM might conduct a program at the local school concerning the importance of utilizing proper safety equipment while riding. Many facilities utilize various programs already established and tailor outreach to the communities. Remember to consult stakeholders for ideas and funding opportunities when initiating a program. Some available stakeholders include, but are not limited to:

- The Brain Injury Alliance of Iowa - www.biaia.org
- Iowa Falls Prevention Coalition-Iowa Department of Public Health - http://idph.iowa.gov/falls-prevention
- The University of Iowa Injury Prevention Research Center - https://www.public-health.uiowa.edu/iprc/
- The American Trauma Society Injury Prevention Repository - http://www.amtrauma.org/page/IPCR
- BETS Stop the Bleed Campaign - https://idph.iowa.gov/bets/stop-the-bleed

Performance Improvement

According to the ACS-COT (2014), it is the role of the TPM to, "monitor clinical processes and outcomes and system issues related to the quality of care provided; develop quality filters, audits, and case reviews; identify trends and sentinel events; and help outline remedial actions while maintaining confidentiality" (p. 43).

This may very well be the most important job function of the TPM. The continual monitoring, identification, and reconciliation of issues identified by the program that lead to suboptimal care of the injured patient is paramount in the development of a high-quality trauma program. When beginning to embark on a program for Performance Improvement and Patient Safety (PIPS), please reference Chapter 16 of the American College of Surgeons Committee on Trauma *Resources for the Optimal Care of the Injured Patient 2014*. This chapter provides operational concepts, program configuration, principals of PIPS, core measures, tables, and the criteria for a high-functioning trauma program. According to the ACS-COT (2014) "performance improvement activities are concordant with the Institute of Medicine's six quality aims for patient care: safe, effective, patient centered, timely, efficient, and equitable" (p. 114). Other resource materials for high-quality PIPS include:

- Individual Hospital Quality Programs
- Healthcare Coalition Partners or Health Network Affiliates
- Institute for Healthcare Improvement – www.ihi.org
- National Academy of Medicine - https://nam.edu/
- American College of Surgeons Committee on Trauma - https://www.facs.org/quality-programs/trauma
- American Hospital Association – Hospitals in Pursuit of Excellence – www.hpoe.org
- Society of Trauma Nurses TOPIC - http://www.traumanurses.org/education/stn-topic

Figure 1 represents the continuous process of performance improvement. The ACS-COT (2014), "calls for each trauma program to demonstrate a continuous process of monitoring, assessment, and management directed at improving care" (p. 114).

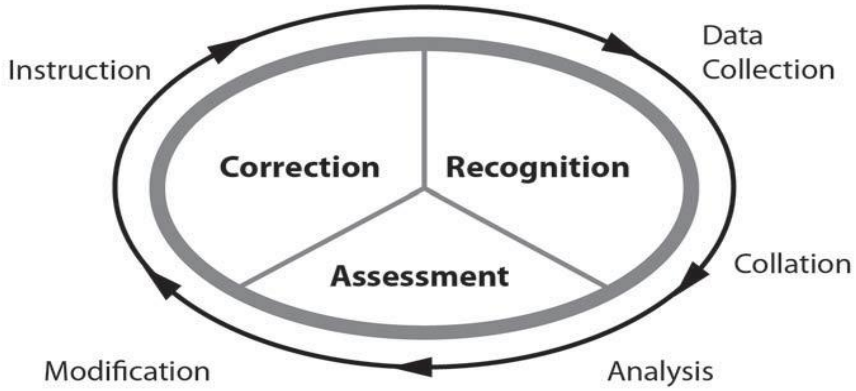


Figure 1. The continuous process of performance improvement. This figure illustrates the circular nature of an effective performance improvement process (ACS-COT, 2014, p. 114).

There are always opportunities for improvement in all levels of trauma centers. High-quality health care is a constantly moving target and the less that is done to monitor, assess, and improve a trauma program, the farther the trauma program will be left behind. A football analogy is a great way to think about performance improvement (PI) and how it does not always originate from negative outcomes. Dr. Donald Jenkin's football analogy reads: it is late in the fourth quarter and your team is down by 5 points. Your quarterback goes back to throw a pass. He is almost sacked several times, but manages to get the pass off. Meanwhile the receiver forgets his route, but manages to catch the ball on his fingertips while balancing on his toes on the side line. TOUCHDOWN and your team wins the game, so outcome good. But the play certainly didn't go as schemed: the offensive line allowed pressure on the quarterback, the receiver ran the wrong route, and the pass was barely caught. The same concepts apply to trauma PI, there are many PI initiatives that can be worked on even when the outcome is good.

The general principle of Performance Improvement and Patient Safety (PIPS) is to improve the value of care delivered to the injured patient. This concept can be demonstrated with a simple equation:

$$\textbf{Value of Care} = \frac{\boldsymbol{Quality\ of\ Process + Quality\ of\ Outcome}}{\boldsymbol{Cost}}$$

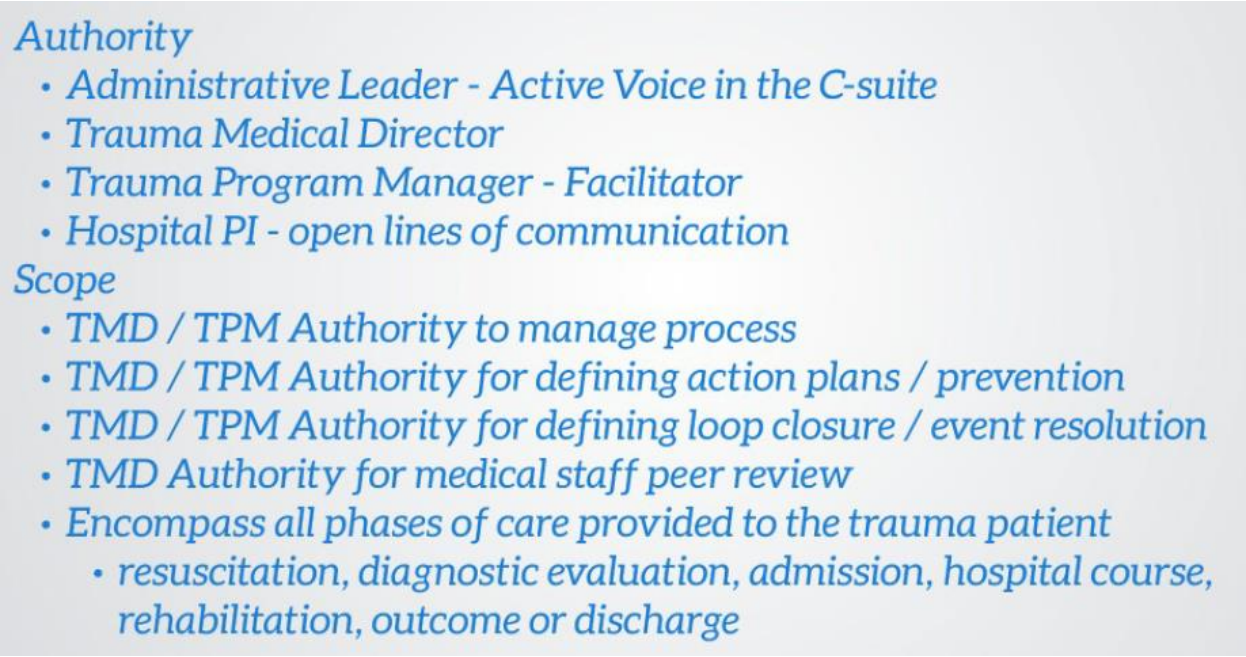
According to the ACS-COT (2014):

> The value of care can be increased by improving the quality of process, improving the quality of outcome, or decreasing cost…the trauma program's scope of performance evaluation extends from institution-wide variables (process review) to measures of individual practitioner performance (peer review). The determinants of how well a trauma center performs include variables that can be influenced (such as efficacy, safety, or cost of care) and variables that cannot be influenced (such as the severity of injury or preexisting co-morbidities) (p. 117).

As the TPM, it will be imperative that the formation of a comprehensive PIPS program is of the highest priority. A PIPS written plan must be in place for a trauma center to be verified at any level. A PIPS written plan establishes the structure of the PIPS program and how it is operationalized, ensures continuity and expectations for all participants in the process, is an educational tool for new staff, and outlines the linkage to the hospital-wide PIPS program. It should contain the following: the philosophy/mission/vision of the institution, the authority and scope of the program, the indicators/audit filters, a process for event identification, the management of data, the committee structure and membership, roles and responsibilities, the levels of review, peer determinations, corrective action planning and implementation, event resolution strategies and re-evaluation, confidentiality of data, and integration into the hospital-wide PIPS process.

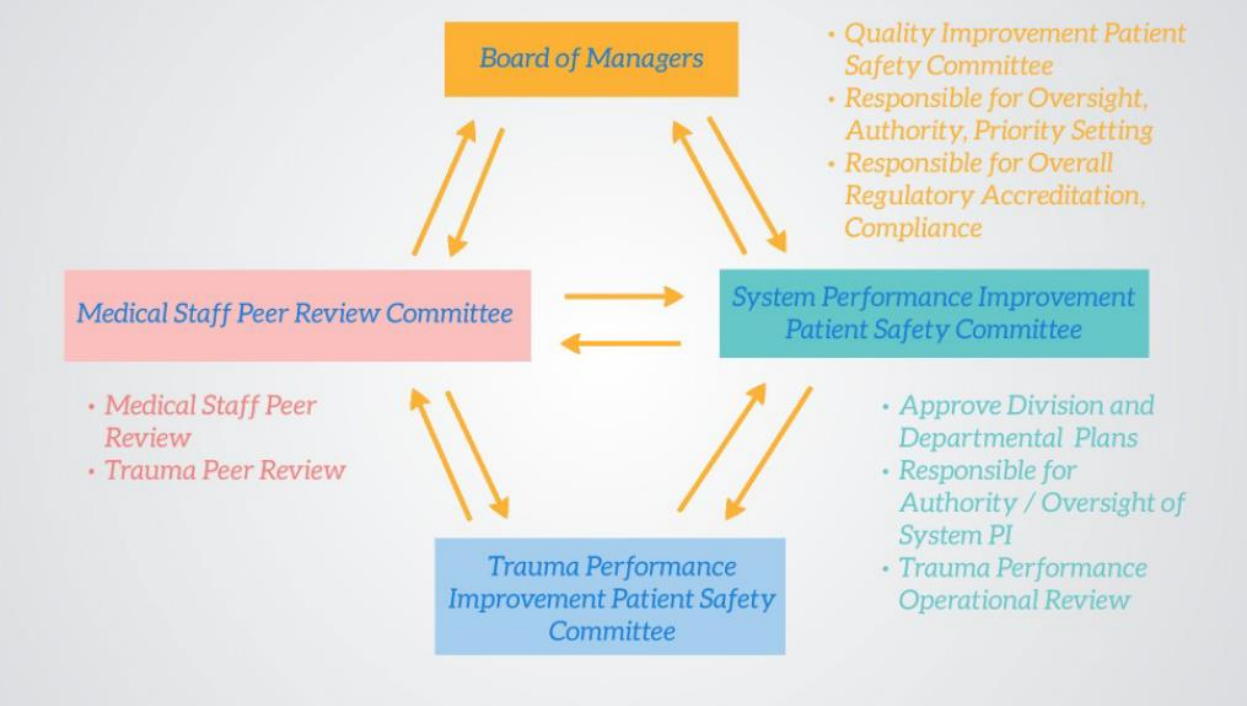
The Iowa Department of Public Health trauma nurse coordinator presented a webinar titled, "Level III PIPS Presentation," which is located here: https://idph.iowa.gov/BETS/Trauma/education-resources. That presentation contains a thorough description of what should be contained in a PIPS written plan and how often it should be updated. The presentation also highlights the requirements for PIPS at a Level III facility and what is required for trauma re-verification as a Level III facility. Also contained on this website page are sample tools for use in a PIPS program.

The first steps in writing a PIPS plan are establishing authority for the program, establishing the team members and their roles and responsibilities, and formalizing links to the institutional PIPS program. Authority and scope for the PIPS program may look something like this:



The committee structure and member roles and responsibilities may look something like this:

The establishment of links to institutional PIPS may look something like this:



The trauma performance improvement patient safety (PIPS) committee is responsible for the trauma re-verifications and compliances for the facility. It is responsible for trauma patient clinical outcomes, processes of care, and coordination of care. It is responsible for formulating the PIPS plan and putting the plan into action. The PIPS committee is responsible for setting goals and reviewing the PIPS plan annually to ensure the plan reflects the most up-to-date standards and outcome measures.

After the committee membership, scope, authority and connections to the institutional PIPS are established in the PIPS plan, the process for adverse event identification can now be outlined. This section of the PIPS plan will answer the question, how does the TPM get notified of a trauma patient having entered into the hospital's care at any point in time and how is an adverse event identified? Many TPMs work with their hospital's coding/billing department and IT to establish reports generated through the electronic medical record in order to identify all trauma patients who meet inclusion criteria for the state trauma registry. After trauma patient identification, charts are then taken through the review process. A good way to establish consistent, non-emotional review of charts is through utilization of a chart audit tool. The chart audit tool will have benchmarks, set by the trauma program, for determining if the patient received expert care in a timely manner. This chart audit tool can help the TPM determine if an adverse event occurred or if the care of the injured patient did not satisfy the trauma program's established benchmarks. The process for how the trauma program identifies patients, performs a consistent chart review, and can identify adverse events should be outlined in the PIPS plan.

After completion of the chart review, the PIPS plan should then provide direction on what level of review the chart should proceed. The levels of review for evaluation of charts is set by the trauma program. In general, the primary review is done by the TPM. This is that initial walk-through of the chart with the chart audit tool. If there are no issues identified that caused harm to the patient or all program benchmarks were met, review of the medical record may be complete at this time. No action or loop closure is necessary. If an event is found that did cause harm to the patient or if a program's benchmarks were not met, then a secondary level of review should be performed. This secondary review is typically done by the TMD. After review by the TMD, an action plan or loop closure may proceed at this time. If the TMD determines the case should go to tertiary review for a provider issue, then the chart review is passed to the multidisciplinary peer review committee. If the TMD determines there is a system issue that needs to be brought for tertiary review, then the system issue is brought to the Trauma PIPS committee or passed to the director of the department in which the system issue was identified. This tertiary review can also be put through an external peer review process or even passed to pre-hospital EMS PIPS programs, depending on where the event occurred and who was involved. The responses from these tertiary reviews should be collected and continuously monitored for follow-up planning and assurance of loop closure. All of these steps should be outlined in the Trauma PIPS Plan.

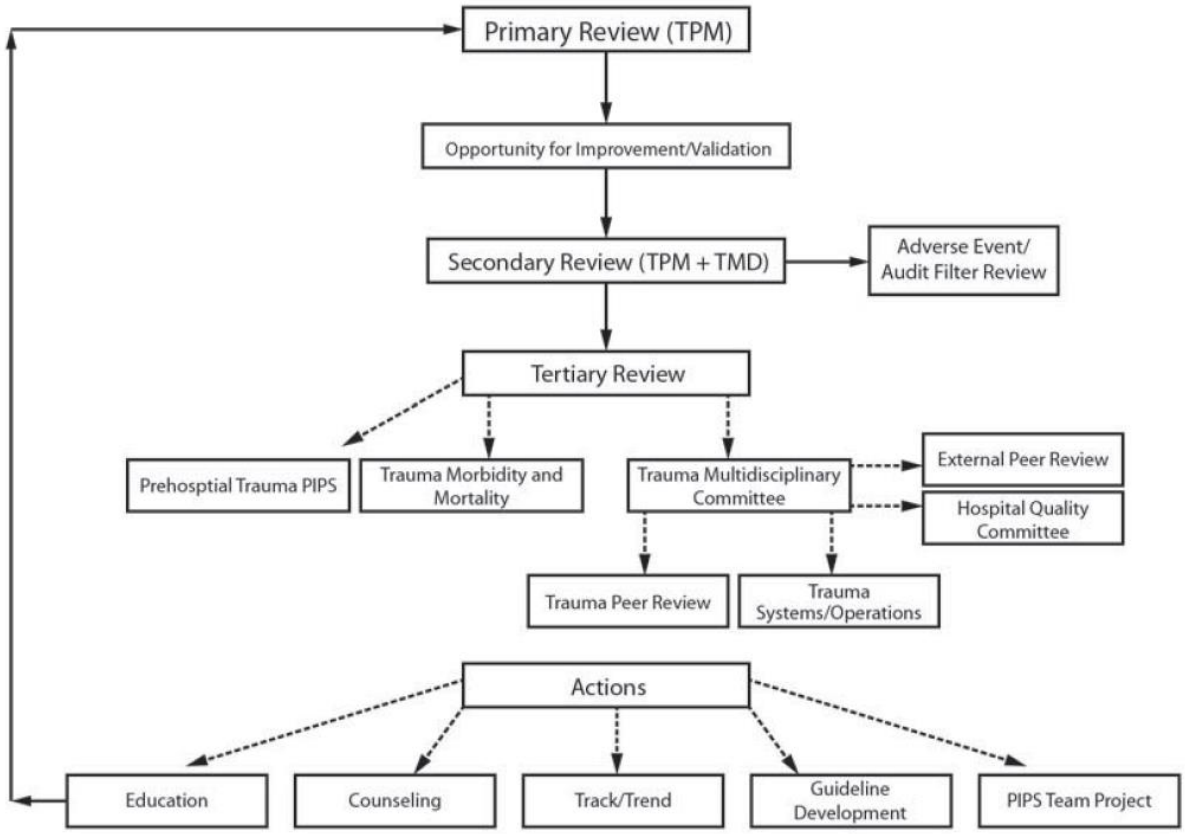


Figure 2. Trauma PIPS Levels of Review. This figure visually demonstrates the levels of review and the circular nature of monitoring actions for effectiveness of event mitigation (ACS-COT, 2014, p. 129).

The actions that can result from performance improvement reviews fall into any of several categories. Education, counseling, track/trend, guideline development, and/or a PIPS team project can result out of an effective PIPS process. These actions should then be monitored for their effectiveness of event mitigation.

An important factor in determining whether an event needs to pass to the secondary review or tertiary review is the level of harm. A level of harm can be determined to be no harm or no detectable harm, minimal harm, moderate harm, severe harm, or death.

- No harm is defined as the standard of care was provided with some deviations with no impact to the patient.
- No detectable harm is the event occurred but did not reach or impact the patient and no treatment was necessary.
- Minimal harm is defined as an impact to the patient, the patient is symptomatic, symptoms are mild, loss of function is minimal or intermediate by short term, and no or minimal intervention (extra observation, investigation review, minor treatment) is required.

- Moderate harm is when the patient is symptomatic, requiring an intervention and there is an increase in length of stay or long term loss of function, there may be a necessitation of higher level of care, but this can be expected to resolve prior to discharge.
- Severe harm is when the patient is symptomatic, requires a life-saving intervention or major surgical/medical critical care intervention, there may be a shortening of life expectancy or major permanent or long term harm or loss of function, there may have been an error in judgement, deviation from practice, or system delays which result in an impact to quality of care and quality of life.
- Death, of course, is when death was caused or brought forward by the event.

There should be a pre-determined level of review, set by the trauma program, which occurs at every determined level of harm. Primary, or level one reviews, typically would occur for all patients who qualify as no harm or no detectable harm. A secondary, or level two review, would then proceed for all subsequent levels of harm. And a tertiary, or level three review, would typically proceed for charts identified as those with an opportunity for improvement, where harm was determined to impact the patient, and that contain a provider issue. As the TPM works through this process the next step, after establishing what the levels of review are going to be for each established level of harm, is to develop or use a PIPS audit form that works for the level of trauma care facility. There are several templates for PIPS audit forms available on this website: https://idph.iowa.gov/BETS/Trauma/education-resources. Templates are also shared among peers. Contact the State of Iowa Trauma Coordinator for access to resources for chart audit templates, if there is not a template identified in the available online resources that would be appropriate for the trauma care facility. A PIPS audit form creates a standardized approach to chart review, it produces a non-emotional validation of the patient chart, it can be used concurrently or retrospectively, and it helps to determine the taxonomy of the event.

Determining event taxonomy helps the TPM lay out, in plain language, the impact to the patient, the type of event, the domain, the cause, prevention of the event, and determination of the event outcome. A great way to utilize the state trauma registry is to use the Performance Improvement tab for documenting the taxonomy of the event. The impact can be determined by the TPM. The impact denotes if the patient had any level of physical harm, psychological harm, legal issue, or socioeconomic (unnecessary treatment/procedure) impact. For example, if communication of the patient condition was inaccurate or incomplete, this field can be marked. The domain of the event, is where the event occurred. For example, pre-hospital, operating room or intensive care unit. The cause of the event, is the factors and/or agents that led to the incident as either system based or human based. And then prevention of the event has prescribed prevention efforts that can be chosen. The determination of the event can be system related or provider related.

Using the state's trauma registry performance improvement tab can move the performance improvement of the facility to being fully electronic if utilized to its full extent.

The PIPS plan should also include how the facility is going to handle data management and confidentiality. Using words like "not discoverable" and "not public" or "confidential for peer review only" when using patient sensitive information during meetings and/or collecting meeting materials after meeting where confidential

patient information is shared are some examples of safe patient information handling. Storing items in a secure location and use of generic identifiers, when able, is another way to protect patient sensitive information. These data management processes should be detailed in the PIPS plan.

After an event goes through the PIPS process there may be a corrective action plan created. This corrective action plan can either be system based or individual based or both. It is important to frame this corrective action plan as a SMART goal. A SMART goal is specific, measureable, achievable, relevant, and time-bound. This helps provide clear guidance and measurability to the corrective action and makes it easier to determine the effectiveness of the plan for future event mitigation.

The PIPS process is very involved, but is perhaps the most important role of the TPM. When programs are consistently adapted to overcome system or provider barriers it helps assure the optimal care of injured patients is consistent across the continuum of care.

Administration

According to the ACS-COT (2014), the role of the TPM is to, "manage, as appropriate, the operational, personnel, and financial aspects of the trauma program. Serves as a liaison to administration, and represents the trauma program on various hospital and community committees to enhance and foster optimal trauma care" (p. 43).

Many small facilities will not have a budget under the purview of the TPM, but if a facility is lucky enough to have a budget dedicated to trauma, the coordinator should manage it as appropriate. The TPM has eyes on the program as a whole and should know where resources should be dedicated in order to improve the quality of the program and the care provided by the facility. Some TPM's have the benefit of a dedicated registrar and/or community outreach coordinator. These people should be under the direction of the TPM and all parties should have a close working relationship dedicated to the improvement of trauma care in the facility. Some coordinators at small facilities occasionally train and recruit floor nurses or ancillary personnel on an ad hoc or volunteer basis to do data abstraction without an FTE associated with the assistance. The bottom line is to use resources judiciously and recruit assistance wherever possible.

Serving as a liaison to administration may be as simple as meeting regularly with the facility's Director of Nursing, or equivalent, to inform him/her of the trauma program and its accomplishments. You may also need to keep the C-suite updated on any difficult cases or sentinel events. Hospital administration can provide resources to the trauma program to help it be successful. Keeping up regular communication can only help to ensure the trauma program has the resources it needs to optimally care for the injured patient.

Representing the trauma program on various hospital and community committees is an excellent way to bring the trauma program visibility within the hospital and in the community at large. Many hospitals have pain, fall, skin, quality, critical care, or various other committees that, along with the individual trauma PIPS and multidisciplinary committees, can help make the program well-rounded and visible to staff. Participation in these various committees can also lead to an easier time with buy-in, when it comes to practice changes instituted by the trauma program. It will be beneficial to the program, if the TPM looks into the healthcare coalition's emergency preparedness activities and tries to engage with key stakeholders. The Healthcare Coalition may have access to grants and resources otherwise unavailable to the TPM. Community committees may be a little harder to come across, but efforts to volunteer with community based organizations may be beneficial to building bridges within the surrounding area, so that, when the program does have a targeted outreach activity, there may be already established partnerships with mutual goals to utilize. Examples of community based volunteer organizations include, but certainly are not limited to:

- Mothers Against Drunk Driving – www.madd.org
- The Boys and Girls Clubs of America – www.bgca.org
- The American Red Cross – www.redcross.org
- The Trauma Informed Care Project - http://www.traumainformedcareproject.org/

Supervision of the Trauma Registry

According to the ACS-COT (2014), the role of the TPM is to, "supervise collection, coding, scoring, and developing processes for validation of data. Design the registry to facilitate performance improvement activities, trend reports and research while protecting confidentiality" (p. 43).

The State of Iowa currently uses ImageTrend as their software vendor for the collection of Iowa's trauma data. The website for the registry can be found at: https://patientregistry.imagetrend.com/iowa/. Access to the system can be granted by any of the State of Iowa Trauma Program Administrators. Current contact information can be found under the references section of the manual.

As outlined in Iowa Administrative Code 164 – 134 Trauma Care Facility Categorization and Verification, 80 percent of trauma incidents should be entered into the ImageTrend Registry no later than 60 days after discharge. The inclusion criteria for incidents that should be entered into the trauma registry can be found in the data dictionary developed by the State of Iowa Trauma Program. The current copy of the data dictionary can be found here: https://idph.iowa.gov/BETS/Trauma/data-registry. Level III facilities in Iowa are required to submit their data to the National Trauma Data Bank, along with submission to the State of Iowa Trauma Registry. Information on submission to the National Trauma Data Bank can be found on this website: https://www.facs.org/quality-programs/trauma/ntdb

The data dictionary provides the TPM with guidance for completion and definitions of the data fields contained in the trauma registry. Each data field has a definition associated with the data element, a field value, additional information, including whether or not the field is required by the State, National Trauma Data Bank (NTDB), or the Trauma Quality Improvement Program (TQIP), the State Validation score (the number of percentage points that will be deducted from the incident's validity score due to blank or invalid values) for the data element, and the ImageTrend data element tag. The definition of the data field helps to clarify what the field is actually asking for. The field value describes what format the field is asking for the data in as either alpha, numeric, or month/day/year, or whether it is looking for time in military, or open text, etc. Direct questions or issues related to the ImageTrend Registry to the Statistical Research Analyst at the State Trauma Program.

While filling in fields, it is important to assure the accuracy of each incident. Public health uses the registry for many different, but equally important initiatives. The State Trauma Program uses the registry to guide research, injury prevention initiatives, develop education and training programs, and advise the Trauma System Advisory Council and State Legislators on injury data across the State. On a local level, TPMs should use the registry to guide performance improvement activities, tailor community outreach and injury prevention activities, and develop education and training programs for staff members.

It is important to note and make sure to educate any registry staff on the importance of the "diagnosis tab" while entering an incident in ImageTrend. Using the diagnosis "look up" button is an easy way to drill down to the most specific ICD-10 code available for the patient. Providing the most specific code for each diagnosis can help the Department of Public Health reposition the trauma system, in order to meet the challenge of protecting and improving the health of all Iowans. The primary diagnosis code must end in either the letter

"A" or if unable to be as specific to drill down to the letter A, the ICD-10 code can end in a number. This qualifier "A" represents an initial encounter and has to be used for as the primary diagnosis code.

For example, for the primary diagnosis on a patient with an Anterior displaced Type II dens closed fracture, the ICD-10 code should either be S12.110A or can be S12.1, S12.10, S12.11, or S12.110 (if not able to further specify). It canNOT be S12.110D or S12.110G. However, those codes can be used as non-primary diagnosis codes.

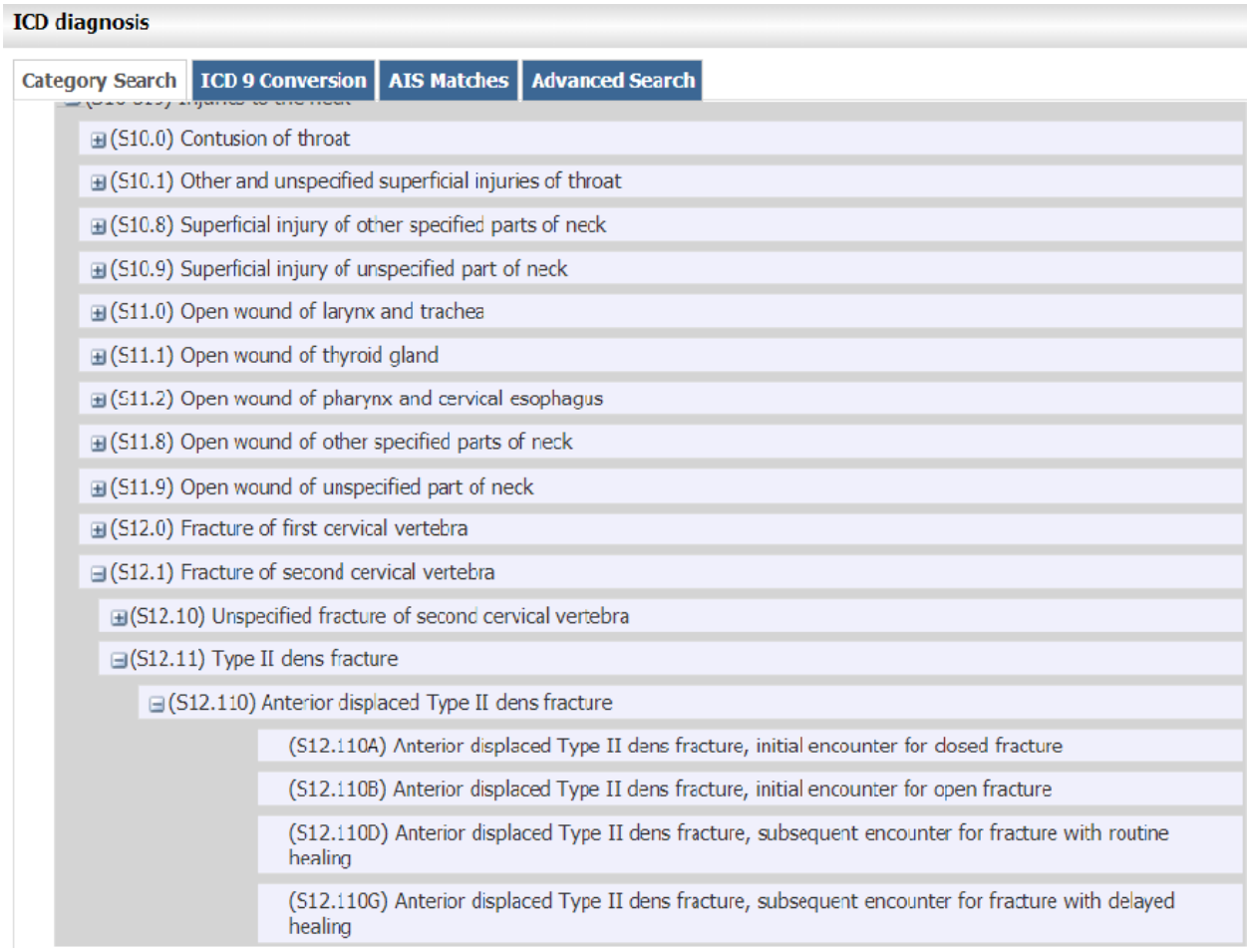


Figure 3. Screenshot of the ImageTrend Registry Diagnosis Search Box.

The primary diagnosis code that ends in "A" should be the first diagnosis code listed for the patient. The order of the codes can be changed by dragging and dropping the primary diagnosis code by the large bolded arrows next to the correct code. An example is provided below:

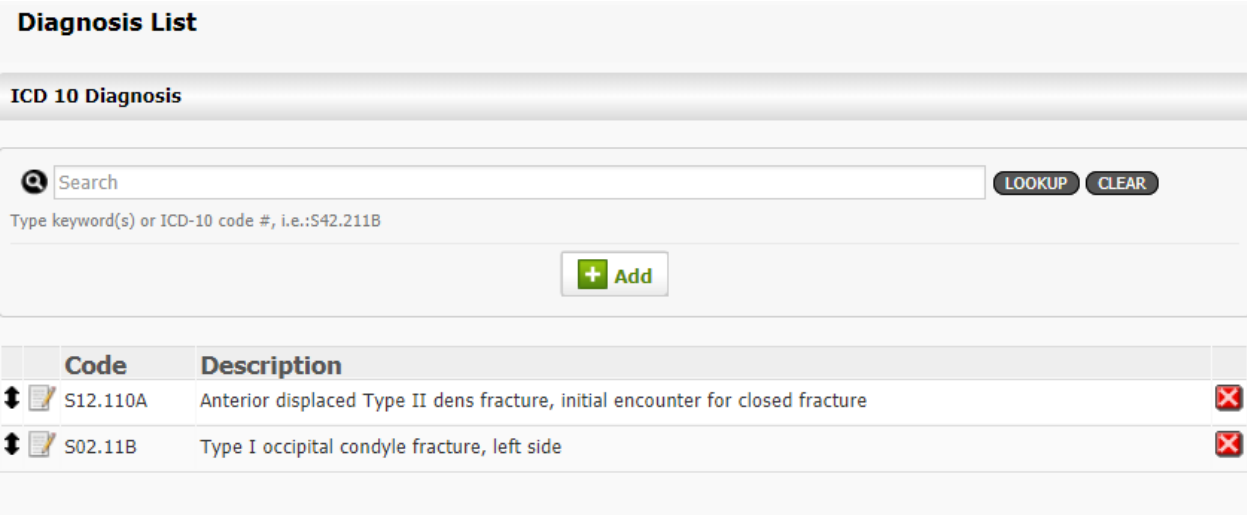


Figure 4. Screenshot of the ImageTrend Registry Patient Diagnosis List by ICD-10 Diagnosis Code.

Any questions should be directed to the Statistical Research Analyst at BETS.

Equally important to the diagnosis code is the Abbreviated Injury Scale (AIS). The best way to find the most accurate AIS score is to utilize the "look up" button next to the field. According to the Association for the Advancement of Automotive Medicine, the AIS, "provides standardized terminology to describe injuries and ranks injuries by severity" (n.d). The Injury Severity Score (ISS) is calculated from the AIS.

ISS splits the body into six categories: head/neck, face, chest, abdomen, extremity, and external (skin). Only the highest AIS number in each body region is used to calculate the ISS. The highest injured body region scores are then squared. The three highest squares are then added together to produce the ISS. An example is below:

Body Region	Injury Description	AIS	Square Highest 3 AIS
Head/Neck	Cerebral contusion	3	9
Face	No injury	0	
Chest	Flail Chest	4	16
Abdomen	Minor Contusion Liver Complex Rupture Spleen	2 5	 25
Extremity	Fractured Femur	3	9
External (skin)	No injury	0	

Addition of highest three AIS squares in this injured patient: $9 + 16 + 25 = 50$

This patient's ISS is 50.

After the calculation of the ISS, the next step is to understand what an ISS of 50 means for the patient. ISS ranges from 1-75. If an injury is assigned an AIS of 6 (un-survivable injury), the ISS score is automatically assigned a 75. ISS correlates linearly with mortality, morbidity, and length of hospital stay. Meaning, the higher the score, the greater the risk of mortality, morbidity, and the longer expected length of hospital stay. One of the weaknesses of the ISS is that any error in AIS coding will result in an error in calculated ISS. Therefore, it is vitally important to code the AIS accurately in order to best predict an injured patient's outcome. An AIS course is available through the Association for the Advancement of Automotive Medicine. Participation in this course may increase the familiarity with the scale and provide clarification to the importance of accuracy while coding traumatic injuries. Information on the course can be found here: http://training.aaam.org/.

The ACS-COT (2014) defines major trauma patients as those with an ISS greater than 16. It is the role of the TPM to supervise the trauma registrar and in many cases act as the trauma registrar. To this end, it is vitally important to understand the necessity for accuracy in coding injuries and keeping an accurate record of the patient. The trauma registry is used for performance improvement in the system, research, and guides injury prevention efforts across the state. If questions remain regarding the trauma registry, entry into the registry, or injury coding contact the Statistical Research Analyst at BETS for assistance.

Consultant and Liaison

According to the ACS-COT (2014), the role of the TPM is to, "stabilize the complex network of the many disciplines that work in concert to provide high-quality care. Serve as an internal resource for staff in all departments, and act as a liaison for EMS agencies" (p. 43).

The size of the facility's network will vary, but trauma programs will at one point or another come into contact with Emergency Medical Services (either based in-hospital or out-of-hospital), the Emergency Department, the Laboratory Department, and the Radiology Department included in their network. Examples of other disciplines in the trauma network may include, but is not limited to, the Surgical Department, Anesthesia, Orthopedic Surgery, Neurosurgery, the Critical Care Department, the Medical/Surgical Department, Physical and Occupational Therapy, Speech Therapy, Case Management, Administration, and Social Work. It is the job of the TPM to assure that these disciplines are communicating needs, educating staff, and working as a cohesive unit to assure the delivery of high-quality evidence-based trauma care to each injured patient across the continuum.

The TPM should educate him or herself on the most up-to-date practice guidelines in trauma care. Increasing the network of the TPM and reaching out to other TPMs in the state will help to establish a base of support. Belonging to state and nationwide organizations will increase the TPM's exposure to high-quality trauma care initiatives and provide opportunities for benchmarking. This will serve the TPM well and guide him or her to becoming a reliable resource for the trauma network. These organizations include, but are not limited to:

- Society of Trauma Nurses - www.traumanurses.org
- Iowa Hospital Association – Iowa Trauma Coordinators - www.ihaonline.org
- Emergency Nurses Association- https://www.ena.org
- The American Trauma Society - http://www.amtrauma.org/

When establishing a relationship with EMS personnel, the TPM should first find out which Emergency Medical Services (EMS) transport to and from the facility. It is important to develop a close working relationship with the service directors of those services, instead of approaching the individuals providing direct care. Service directors should be approached for performance improvement initiatives and loop closure by the TPM. Run reports (the incident report of the EMS interaction with the trauma patient before arriving at the hospital) are required, in the state of Iowa, to be provided to the receiving hospital within 24 hours of a patient being transported to the trauma care facility. The hospital staff should communicate with their TPM and the TPM should have discussions with the service director about what form the run reports should be submitted. Run reports can either be submitted in a paper or electronic form. A compromise should be made, which includes input from both sides, on which form will be the best and most convenient for both parties involved. Serving as a liaison to EMS can increase the trust between the two organizations and build bridges for the future. Many EMS have excellent community outreach activities and if the facility has limited resources for outreach, establishing a relationship with those services can help the hospital accomplish its outreach goals and initiatives.

Research

According to the ACS-COT (2014), it is the role of the TPM to, "have an active involvement in research projects and the analysis and distribution of findings. Facilitate protocol design for accurate data collection, feedback, and analysis" (p. 43).

Involvement in research will look very different at each verified level of trauma. At the large level I ACS verified facilities in Iowa, research is being conducted and a direct involvement is available to those TPMs. At small level IV facilities, this looks like participation in the state trauma registry. The TPM at these small facilities may also look into doing their own research, but should reach out to their partners at larger facilities in the state for guidance. Some important resources in this state include:

- The University of Iowa Injury Prevention and Research Center - https://www.public-health.uiowa.edu/iprc/ or https://www.public-health.uiowa.edu/iprc/resources/burden-of-injury-in-ia/

The BETS Statistical Research Analys, under guidance from the System Evaluation and Quality Improvement Sub-committee (SEQIS) of the Trauma System Advisory Council (TSAC), distributes a report of trauma care facility performance indicators quarterly. The use of these performance indicators can help to guide performance improvement and research efforts at the trauma care facility. Here are some more resources to help guide you towards creating a high quality research project:

- Society for Advancement of Violence and Injury Research(SAVIR)- https://savir.wildapricot.org/
- Safe States- http://www.safestates.org/
- Iowa Governor's Traffic Safety Bureau- http://www.dps.state.ia.us/commis/gtsb/
- Centers for Disease Control- https://www.cdc.gov/injury/index.html or https://www.cdc.gov/injury/researchpriorities/index.html
- American Trauma Society- http://www.amtrauma.org/
- Trauma.Org- http://trauma.org/

Please contact the State Trauma Program Administrators for any additional information or access to resources.

Community and National Involvement in Trauma Care Systems

According to the ACS-COT (2014), the role of the TPM is to, "participate in the development of trauma care systems at the community, state, provincial, or national levels" (p. 43).

Development of trauma care systems in your community means acting as a liaison between EMS, Hospital Personnel, Definitive Care Facilities, Skilled Nursing Facilities, Home Health Care, Nursing Homes, and Rehabilitation Facilities located in your community. Acting as a liaison provides the TPM with the ability to help facilitate a smooth transition of care for trauma patients across the continuum and analyze care at a system level. Participation in the community as a liaison also helps the TPM affect change in the trauma program by providing connections and building relationships between facilities. Participation in the local Healthcare Coalition or Service Area can provide important bridges needed to establish relationships across the trauma spectrum.

State level engagement in the trauma system can occur in many different ways. Participation in the Iowa Hospital Association's Iowa Trauma Coordinators provides the TPM with a resource pool of coordinators across the state. Iowa has a robust history of system development and has an established a Trauma System Advisory Council (TSAC). Participation in attendance at these meetings allows the trauma coordinator to have a voice in system development across the state. TSAC has a variety of subcommittees which host open meetings and are available for listeners to provide input. These committee dates, times, and locations can either be found on the Iowa Department of Public Health Bureau of Emergency and Trauma Services website or by contacting the State Trauma Program Administrators.

- IDPH Bureau of Emergency and Trauma Services Website - https://idph.iowa.gov/BETS/Trauma

National participation can be accomplished through joining national organizations. This include, but are not limited to:

- Society of Trauma Nurses- http://www.traumanurses.org/
- Emergency Nurses Association- https://www.ena.org/
- Air and Surface Transport Nurses Association- http://astna.org/
- American Trauma Society- http://www.amtrauma.org/
- American Nurses Association- http://www.nursingworld.org/

TPMs also have the opportunity to be active and engaged in the trauma care facility's service area. Each hospital in Iowa belongs to a service area based off of intra-facility transport data. Trauma performance improvement is being conducted at the service area level. Meetings are conducted quarterly and provide a great opportunity to work with other TPMs in the service area on trauma specific projects.

For more ways to get involved, contact the State of Iowa Trauma Program Administrators.

Hospital Verification

The State of Iowa Trauma Coordinator oversees the verification of all Trauma Level III and IV hospitals that are not verified by the American College of Surgeons. The administrative rules that govern the categorization and verification of each trauma level are in Iowa Administrative Code (IAC 641-134.2 (147A) and (IAC 641-134.2(3) a) and b). Those rules can be found on the Bureau of Emergency and Trauma Services Website at: https://idph.iowa.gov/BETS/Trauma/rules. *The Resources for the Optimal Care of the Injured Patient 2014* by the American College of Surgeons Committee on Trauma is adopted by reference into rule. These are the criteria by which Iowa trauma facilities are verified. The book is available for free download at: https://www.facs.org/quality-programs/trauma/vrc/resources. It is highly recommended that each TPM obtain a copy and familiarize him or herself with its contents. The criteria are separated by trauma level. Each TPM should become familiar with their specific trauma level's criteria.

The Re-Verification Process

Re-verification is the process by which each trauma care facility receives its trauma verification every three years. Each trauma care facility's re-verification due date is found on the verification certificate obtained at the time of the last designation. The TPM should contact the State of Iowa Trauma Coordinator if a certificate cannot be located. Six months before the facility's re-verification due date, the State of Iowa Trauma Coordinator will contact the TPM with an email communication. This communication will contain the re-verification application, as well as, other reference material needed to successfully fill out the application. The self-assessment categorization application (SACA) contains all the necessary information needed for re-verification. The application asks that several policies, procedures, and meeting minutes be included with the application as attachments. All materials are to be gathered by the TPM and sent to the State of Iowa Trauma Coordinator (preferably electronically, but can be by mail) four months before the facility's re-verification due date. The material's due date will be provided by the State of Iowa Trauma Coordinator in the six-month re-verification notification email. After the TPM sends the application to the State of Iowa Trauma Coordinator, the Trauma Coordinator does an initial review of the materials and communicates with the TPM for any additional materials needed.

All Level III trauma facilities are verified by an on-site visit. Level IV facilities can opt-in to an on-site visit. Only Level IV facilities can be verified by a paper review. After the review is finished, the facility receives a final report from the State of Iowa Trauma Coordinator. This report contains strengths of the trauma program, any criterion deficiencies, and recommendations for the facility to consider to further develop the trauma program before the next re-verification. The facility will also receive a verification certificate, which will verify the facility for three years from the current verification certificate end-date. And, depending on existence of criteria deficiencies, the facility will receive a re-verification letter congratulating it on another successful re-verification. This process will be detailed in the following sections.

On-site Reviews

An on-site review is conducted on all Level III Facilities. At a Level III facility, a survey team is comprised of two survey physicians, one of which must be a surgeon and a nurse surveyor (typically a TPM from another facility), and the State of Iowa Trauma Coordinator. A Level III on-site review typically lasts approximately five hours. During this time, an opening session with hospital administration and board members is conducted, in order for, the survey team to gain an understanding of the support for the trauma program and the goals which it seeks to achieve. The next session consists of an interview with the TPM and TMD in order to glean the working relationship and see how the facility's processes and practices are put into practice. A brief tour of the Emergency Room and Trauma Bays follows, with subsequent trips to Radiology, Lab, the Operating Room, and the ICU. The team may also request to see various other portions of the hospital, depending on time. The tour is followed by a chart review.

The chart review is conducted differently at different sites, depending on the availability of resources. The survey team asks that 10-15 charts are pulled for a good sampling of trauma patients that may come into contact with the trauma program at any point in time. Examples of charts to pull include those trauma patients with an ISS>15, deaths, transfers out, pediatric patients, and patients that go straight to the OR. The TPM and TMD can present these cases in whatever method deemed appropriate by the facility. Many TPM's and TMD's project the electronic medical record on a large screen and walk the survey team through the hospital course of the patient. Others, present case studies on patients incorporating the process improvement strategies utilized and loop closure. The method of delivery is left up to the TPM and TMD and the facility.

After the case presentation, the survey team will hold a closed meeting to discuss the application and the findings. Subsequently, an open presentation to discuss the findings of the survey team is held, which anyone whom the trauma program deems appropriate to attend is allowed to do so. It is highly encouraged to have hospital administration and if possible, board members attend this final presentation, so that those stakeholders can better understand the needs of the trauma program and the resources that should be allocated to it.

An on-site visit has slight differences at a Level IV facility. The survey team consists of either a Trauma Surgeon or an Emergency Physician and a nurse surveyor, along with the State of Iowa Trauma Coordinator. The time allocated for a facility tour is decreased due to the smaller size (generally) and fewer departments. There is also less time allocated to chart review, where only 5-10 charts are reviewed. There is still a presentation of findings at the end of the day to which trauma programs are encouraged to invite the administration and board.

The site visits exist as a platform to exchange information and educate both sides of the table. The survey team members are there to verify the contents of the SACA and provide education and support to the facility's trauma program. The goal is to make sure the trauma program at any particular facility has the resources and education it needs to provide the best possible evidence-based care that it can to injured patients in the

community. The survey team also gets the chance to learn about the facility and how it fits into the trauma system as a whole.

Paper Reviews

Level IV facilities can decide to proceed with a paper review if an on-site review would put undue stress on the facility for staffing purposes or otherwise. A paper review is conducted by a nurse survey team member and the State of Iowa Trauma Coordinator. During the review period the TPM at the facility being reviewed may be contacted by either the survey team member or the State of Iowa Trauma Coordinator for clarification or interview. The survey team member and the State of Iowa Trauma Coordinator corroborate their findings and then present the facility with a final report and certificate. While this is a satisfactory way to re-verify as a facility, it does not afford the Level IV facility the readily available access to trauma experts in the state as does an on-site review. It also gives a limited perspective, what can be shown on paper, to the survey team members and does not allow the facility the opportunity to elaborate on their processes, procedures, and how care is given at their facility.

Disciplinary Action

Disciplinary action is decided upon in conjunction with recommendations from the survey team members, the State of Iowa Trauma Coordinator, the Bureau Chief of the Bureau of Emergency and Trauma Services, and the Assistant Attorney General's office.

With the adoption of the *Resources for the Optimal Care of the Injured Patient 2014*, a criterion deficiency is separated into one of three types.

- Type I –The trauma care facility can rectify the deficiency by a plan of correction and a focused site visit in three months.
- Type II – The trauma care facility can rectify the deficiency with a paper report in 6-12 months.
- Type IIB – The trauma care facility can rectify the deficiency with a focused site visit in 6 – 12 months.

Whether a criterion is I, II or IIB will be determined by the Bureau of Emergency and Trauma Services with recommendations from the Verification Subcommittee of TSAC based upon standards put forth by the American College of Surgeons Committee on Trauma in the *Resources for the Optimal Care of the Injured Patient 2014.*

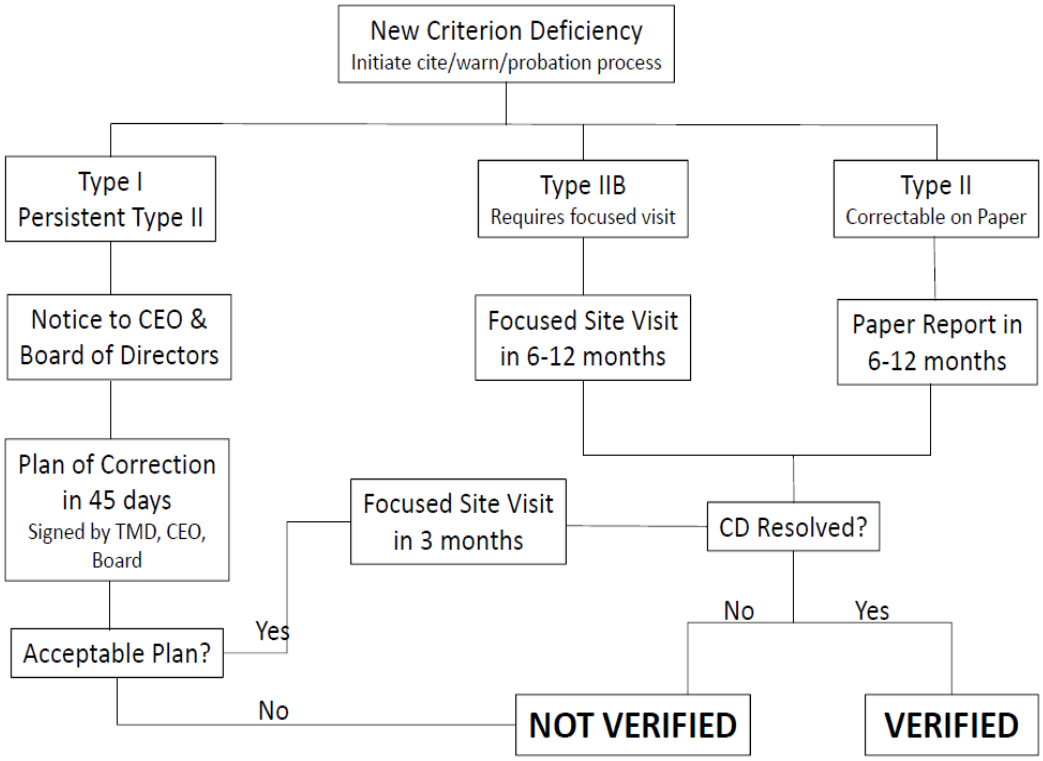


Figure 3. Graphic depiction of the criterion deficiency process.

Questions concerning re-verification and the disciplinary process should be directed to the State of Iowa Trauma Coordinator.

Administrative Rules and Statute

Statute 147A establishes Iowa as an inclusive trauma system. Which means, all hospitals in Iowa must be verified at the level of care which can be provided by the facility.

The administrative rules governing the trauma system are contained in Chapters 164 – 134 through 164 – 138. They can be found online through the Bureau of Emergency and Trauma Services Website at:

https://idph.iowa.gov/BETS/Trauma/rules

Chapter 164 – 134 is titled Trauma Care Facility Categorization and Verification. It outlines how each trauma center is categorized and verified and what criteria are used for these purposes. This rule also establishes that proceedings, records, and reports developed pursuant to this chapter constitute peer review records and are not subject to discovery by subpoena or admissible as evidence. And that all information and documents received by the Iowa Department of Public Health from a hospital, emergency care facility, or trauma care facility shall be confidential.

Chapter 164 – 135 is titled Trauma Triage and Transfer Protocols. It outlines the use of trauma triage and transfer protocols that have been approved by the department, to assist personnel from each EMS service program and trauma care facility. The out-of-hospital trauma Triage Destination Decision Protocol for adults and pediatrics is adopted by reference in this administrative rule. Those protocols are available here: https://idph.iowa.gov/BETS/Trauma

Chapter 164 – 136 is titled Trauma Registry. It outlines the use of the Iowa Trauma Patient Data Dictionary for use of reportable patient data. The chapter also discusses the submission benchmark of 80 percent of cases entered into the registry within 60 days of patient discharge. It also outlines the release of reportable patient data and the requests thereof.

Chapter 164 – 137 is titled Trauma Education and Training. This chapter outlines initial trauma education requirements for physicians, physician assistants, advanced registered nurse practitioners, registered nurses, and licensed practical nurses who are identified as trauma team members. Registered nurses should complete Trauma Nursing Course Objectives (2007) within one year of hire. Physicians, PAs, and ARNPs are required to comply with the education criteria specific to the level for which the facility is verified. For continuing education RN's and LPN's must complete 16 hours of continuing trauma education with a minimum of four hours as formal education every four years. Physicians, PAs, and ARNPs are required to comply with the education criteria specific to the level for which the trauma care facility is verified.

Chapter 164 – 138 is titled Trauma System Advisory Council. This rule establishes the purpose and duties of TSAC, as well as, the membership and officers. This rule also outlines the meetings, subcommittee designation, confidentiality, documentation, and expenses of the council.

It is important to review the statute and Administrative Rules and understand their importance to the trauma program. These rules establish the guidance for the facility's trauma program and is the binding contract by which every trauma care facility must abide.

Trauma Center Verification Criteria

Level III Criteria for verification are adopted by reference into Iowa Administrative Code from the *Resources for the Optimal Care of the Injured Patient* (ACS-COT, 2014).

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 1: Trauma Systems			
1 - 1	III	The individual trauma centers and their health care providers are essential system resources that must be active and engaged participants (CD 1 – 1).	Type II
1 - 2	III	They must function in a way that pushes trauma center-based standardization, integration, and PIPS out to the region while engaging in inclusive trauma system planning and development (CD 1-2).	Type II
1 - 3	III	Meaningful involvement in state and regional trauma system planning, development, and operation is essential for all designated trauma centers and participating acute care facilities within a region (CD 1-3).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 2: Description of Trauma Centers and Their Roles In a Trauma System			
2 - 1	III	This trauma center must have an integrated, concurrent performance improvement and patient safety (PIPS) program to ensure optimal care and continuous improvement In care (CD 2 – 1).	Type I
2 - 2	III	Surgical commitment is essential for a properly functioning trauma center (CD 2 – 2).	Type I
2 - 3	III	Trauma centers must be able to provide the necessary human and physical resources (physical plant and equipment) to properly administer acute care consistent with their level of verification (CD 2 – 2).	Type IIB
2 - 5	III	Through the trauma PIPS program and hospital policy, the trauma director must have responsibility and authority for determining each general surgeon's ability to participate on the trauma panel based on an annual review (CD 2 – 5).	Type II
2 - 8	III	For Level III trauma centers, it is expected that the surgeon will be in the emergency department on patient arrival, with adequate notification from the field. The maximum acceptable response time for the highest-level activation tracked from patient arrival is 30 minutes. The minimum criteria for full trauma team activation are provided in Table 2 in Chapter 5. The program must demonstrate that the surgeon's presence is in compliance at least 80 percent of the time.	Type I
2 - 12	III	A Level III trauma center must have continuous general surgical coverage (CD 2 – 12).	Type II
2 - 13	III	Well-defined transfer plans are essential (CD 2 – 13).	Type II
2 - 17	III	For Level III trauma centers, a trauma medical director and trauma program manager knowledgeable and involved in trauma care must work together with guidance from the trauma peer review committee to identify events, develop corrective action plans, and ensure methods of monitoring, reevaluation, and benchmarking (CD 2 - 17)	Type IIB

2 - 18	III	Level III trauma center the multidisciplinary trauma peer review committee must meet regularly, with required attendance of medical staff active in trauma resuscitation, to review systemic and care provider issues, as well as propose improvement to the care of the injure (CD 2 – 18).	Type IIB
2 - 19	III	A PIPS program must have audit filters to review and improve pediatric and adult patient care (CD 2 – 19).	Type II
2 - 22	III	Level III trauma centers must participate in regional disaster management plans and exercises (CD 2 – 22).	Type II
2 – 23	III	Any adult trauma center that annually admits 100 or more injured children younger than 15 years must fulfill the following additional criteria demonstrating their capability to care for injured children: trauma surgeons must be credentialed for pediatric trauma care by the hospital's credentialing body (CD 2 – 23).	Type II
2 – 24	III	There must be a pediatric emergency department area, a pediatric intensive care area, appropriate resuscitation equipment, and a pediatric specific trauma PIPS Program (CD 2 – 24).	Type II
2 - 25	III	For adult trauma centers annually admitting fewer than 100 injured children younger than 15 years, these resources are desirable. These hospitals, however, must review the care of their injured children through their PIPS program (CD 2-25).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 3: Prehospital Trauma Care			
3 – 1	III	The trauma program must participate in the training of prehospital personnel, the development and improvement of prehospital care protocols, and the performance improvement an patient safety programs (CD 3 – 1)	Type II
3 – 2	III	The protocols that guide prehospital trauma care must be established by the trauma health care team, including surgeons, emergency physicians, medical directors for EMS agencies, and basic and advanced prehospital personnel (CD 3-2).	Type II
3 – 3	III	Rigorous multidisciplinary performance improvement is essential to evaluate overtriage and undertriage rates to attain the optimal goal of less than 5 percent undertriage (CD 3 – 3).	Type II
3 – 4	III	The trauma director must be involved in the development of the trauma center's bypass (diversion) protocol (CD 3 – 4).	Type II
3 – 5	III	The trauma surgeon must be involved in the decision regarding bypass (diversion) each time the center goes on bypass (CD 3 – 5).	Type II
3 – 6	III	The trauma center must not be on bypass (diversion) more than 5 percent of the time (CD 3 – 6).	Type II
3 – 7	III	When a trauma center is required to go on bypass or to divert, the center must have a system to notify dispatch and EMS agencies (CD 3 – 7). The center must do the following: • Prearrange alternative destinations with transfer agreements in place • Notify other centers of divert or advisory status • Maintain a divert log • Subject all diverts and advisories to performance improvement procedures	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 4: Inter-hospital Transfer			
4 - 1	III	Direct physician-to-physician contact is essential (CD 4 – 1).	Type II
4 - 2	III	The decision to transfer an injured patient to a specialty care facility in an acute situation must be based solely on the needs of the patient and not on the requirements of the patient's specific provider network (for example, a health maintenance organization or a preferred provider organization) or the patient's ability to pay (CD 4 – 2)	Type II
4 - 3	III	A very important aspect of inter-hospital transfer is an effective PIPS program that includes evaluating transport activities (CD 4 – 3).	Type II
4 - 4	III	Perform a PIPS review of all transfers (CD 4 – 3).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 5: Hospital Organization and the Trauma Program			
5 – 1	III	A decision by a hospital to become a trauma center requires the commitment of the institutional governing body and the medical staff (CD 5 – 1)	Type I
5 – 1	III	Documentation of administrative commitment is required from the governing body and the medical staff (CD 5 – 1).	Type I
5 – 2	III	This [administrative] support must be reaffirmed continually (every 3 years) and must be current at the time of verification (CD 5 – 2).	Type II
5 – 3	III	The [medical staff] support must be reaffirmed continually (every 3 years) and must be current at the time of verification (CD 5 – 3).	Type II
5 – 4	III	The trauma program must involve multiple disciplines and transcend normal departmental hierarchies (CD 5 – 4).	Type I
5 – 5	III	The TMD must be a current board-certified general surgeon (or a general surgeon eligible for certification by the American board of Surgery according to current requirements) or a general surgeon who is an American College of Surgeons Fellow with a special interest in trauma care and must participate in trauma call (CD 5 – 5).	Type I
5 – 6	III	The TMD must be current in Advanced Trauma Life Support® (ATLS®) (CD 5 – 6).	Type II
5 – 9	III	The TMD must have the authority to manage all aspects of trauma care (CD 5 – 9).	Type IIB
5 – 10	III	The TMD must chair and attend a minimum of 50% of the multidisciplinary trauma peer review committee meetings. (CD 5 – 10).	Type II
5 – 11	III	The TMD, in collaboration with the TPM, must have the authority to correct deficiencies in trauma care and exclude from trauma call the trauma team members who do not meet specified criteria (CD 5 – 11).	Type II
5 – 11	III	In addition, the TMD must perform an annual assessment of the trauma panel providers in the form of Ongoing Professional Practice Evaluation (OPPE) and Focused Professional Practice Evaluation (FPPE) when indicated by findings of the PIPS process (CD 5 – 11).	Type II
5 – 12	III	The TMD must have the responsibility and authority to ensure compliance with the above requirements and cannot direct more than one trauma center (CD 5 – 12).	Type II

5 – 13	III	The criteria for a graded activation must be clearly defined by the trauma center, with the highest level of activation including the six required criteria listed in Table 2 (CD 5 – 13).	Type II
5 – 15	III	In Level III trauma centers the team must be fully assembled within 30 minutes (CD 5 – 15).	Type II
5 – 16	III	Other potential criteria for trauma team activation that have been determined by the trauma program to be included in the various levels of trauma activation must be evaluated on an ongoing basis in the PIPS process (CD 5 – 16) to determine their positive predictive value in identifying patients who require the resources of the full trauma team.	Type II
5 – 16	III	The emergency physician may initially evaluate the limited – tier trauma patient, but the center must have a clearly defined response expectation for the trauma surgical evaluation of those patients requiring admission (CD 5 – 16).	Type II
5 – 17	III	In Level III centers, injured patients may be admitted to individual surgeons, but the structure of the program must allow the trauma director to have oversight authority for the care of these patients (CD 5 – 17).	Type II
5 - 18	III	Programs that admit more than 10%of injured patients to non-surgical services must review all non-surgical admissions through the trauma PIPS process (CD 5 – 18).	Type II
5 – 21	III	There must be a method to identify the injured patients, monitor the provision of health care services, make periodic rounds and hold formal and informal discussions with individual practitioners (CD 5 – 21).	Type I
5 – 22	III	In addition to administrative ability, the TPM must show evidence of educational preparation and clinical experience in the care of injured patients (CD 5 – 22).	Type II
5 - 25	III	The trauma center's PIPS program must have a multidisciplinary trauma peer review committee chaired by the TMD (CD 5 – 25).	Type IIB

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 6: Clinical Functions: General Surgery			
6 – 1	III	General surgeons caring for trauma patients must meet certain requirements, as described herein (CD 6 – 1). These requirements may be considered to be in four categories: current board certification, clinical involvement, performance improvement and patient safety, and education.	Type II
6 – 2	III	Board certification or eligible for certification by the American Board of Surgery according to current requirements or the alternate pathway is essential for general surgeons who take trauma call in Level II trauma centers (CD 6 – 2).	Type II
6 – 3	III	Alternate Criteria (CD 6 – 3) for non-Board-Certified Surgeons in a Level I, II, or III Trauma Centers.	Type II
6 – 4	III	Trauma surgeons must have privileges in general surgery (CD 6 – 4).	Type II
6	III	For Level III trauma centers, the maximum acceptable response time is 30 minutes. Response time will be tracked from patient arrival rather than from notification or activation (this is a subsection of 6 – 5 and 6 – 6). An 80 percent attendance threshold must be met for the highest-level activations (CD 2 – 8).	Type I
6 – 7	III	For Level III trauma centers, the attending surgeon is expected to be present in the operating room for all operations. A mechanism for documenting this presence is essential (CD 6 – 7).	Type II

6	III	In Level III trauma centers, there must be a multidisciplinary trauma peer review committee chaired by the trauma medical director (CD 5 – 25) and representatives from general surgery (CD 6 – 8), and liaisons from orthopedic surgery (CD 9 – 16), emergency medicine (CD 7 – 11), ICU (CD 11 – 62), and anesthesia (CD 11 – 13).	Type II
6 – 8	III	Each member of the group of general surgeons must attend at least 50 percent of the multidisciplinary trauma peer review committee meetings (CD 6 – 8).	Type II
6 – 9	III	All general surgeons on the trauma team must have successfully completed the Advanced Trauma Life Support® (ATLS®) Course at least once (CD 6 – 9).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 7: Clinical Functions: Emergency Medicine			
7 – 1	III	The emergency departments of Level III trauma centers must have a designated emergency physician director supported by an appropriate number of additional physicians to ensure immediate care for injured patients (CD 7 – 1).	Type I
7 – 3	III	Occasionally, in a Level III trauma center, it is necessary for the physician to leave the emergency department for short periods to address in-house emergencies. Such cases and their frequency must be reviewed by the performance improvement an patient safety (PIPS) program to ensure that this practice does not adversely affect the care of patients in the emergency department (CD 7 – 3).	Type II
7 – 4	III	In institutions in which there are emergency medicine residency training programs, supervision must be provided by an in-house attending emergency physician 24 hours per day (CD 7 – 4).	Type II
7 – 5	III	These roles and responsibilities must be defined, agreed on, and approved by the director of the trauma service (CD 7 – 5).	Type II
7 – 6	III	Board certification or eligibility for certification by the appropriate emergency medicine board according to current requirements or the alternate pathway is essential for physicians staffing the emergency department and caring for trauma patients in Level II trauma centers (CD 7 – 6).	Type I
7	III	Alternate Criteria (CD 6 – 3) for Non-Board-Certified Emergency Medicine Physicians Level III Trauma Centers.	Type II
7 – 7	III	Emergency Physicians on the call panel must be regularly involved in the care of injured patients (CD 7 – 7).	Type II
7 – 8	III	A representative from the emergency department must participate in the prehospital PIPS program (CD 7 – 8).	Type II
7 – 9	III	A designated emergency physician liaison must be available to the trauma director for PIPS issues that occur in the emergency department (CD 7 – 9).	Type II
7 – 10	III	Emergency Physicians must participate actively in the overall trauma PIPS program and the multidisciplinary trauma peer review committee (CD 7 – 10).	Type II
7 – 11	III	The emergency medicine liaison on the multidisciplinary trauma peer review committee must attend a minimum of 50 percent of the committee meetings (CD 7 – 11).	Type II
7 – 14	III	In Level III trauma centers, all board-certified emergency physicians or those eligible for certification by an appropriate emergency medicine board according to current requirements must have successfully completed the ATLS® course at least once (CD 7 – 14).	Type II

7 – 15	III	Physicians who are certified by boards other than emergency medicine who treat trauma patients in the emergency department are required to have current ATLS® status (CD 7 – 15)	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 8: Clinical Functions: Neurosurgery			
8 – 5	III	A formal, published contingency plan must be in place for times in which a neurosurgeon is encumbered upon the arrival of a neurotrauma case (CD 8 – 5). The contingency plan must include the following: • A credentialing process to allow the trauma surgeon to provide initial evaluation and stabilization of the neurotrauma patient. • Transfer agreements with a similar or higher-level verified trauma center. • Direct contact with the accepting facility to arrange for expeditious transfer or ongoing monitoring support. • Monitoring of the efficacy of the process by the PIPS program.	Type I
8 – 6	III	If one neurosurgeon covers two centers within the same limited geographic area, there must be a published backup schedule (CD 8 – 6).	Type II
8 – 6	III	In addition, the performance improvement process must demonstrate that appropriate and timely care is provided (CD 8 – 6).	Type II
8 – 7	III	A Level III trauma center must have a plan approved by the trauma medical director that determines which types of neurosurgical injuries may remain and which should be transferred (CD 8 – 7).	Type II
8 – 8	III	Transfer agreements must exist with appropriate level I and Level II trauma centers (CD 8 – 8).	Type I
8 – 9	III	In all cases, whether patients are admitted or transferred, the care must be timely, appropriate, and monitored by the PIPS program (CD 8 – 9).	Type II
8 – 10	III	Board Certification or eligibility for certification by an appropriate neurosurgical board according to the current requirements or the alternate pathway is essential for neurosurgeons who take trauma call in Level III trauma centers (CD 8 – 10).	Type II
8(6-3)	III	Alternate Criteria (CD 6 – 3) for Non-Board-Certified Neurosurgeons in Level III Trauma Centers	Type II
8 – 13	III	Level III centers with any emergent neurosurgical cases must also have the participation of neurosurgery on the multidisciplinary trauma peer review committee (CD 8 – 13).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 9: Clinical Functions: Orthopedic Surgery			
9 – 2	III	Operating rooms must be promptly available to allow for emergency operations on musculoskeletal injuries, such as open fracture debridement and stabilization, external fixator placement, and compartment decompression (CD 9 – 2).	Type I
9 - 4	III	Level III trauma centers must have an orthopedic surgeon who is identified as the liaison to the trauma program (CD 9- 4).	Type I

9 - 11	III	Level III facilities vary significantly in the staff and resources that they can commit to musculoskeletal trauma care, but they must have an orthopedic surgeon on call and promptly available 24 hours a day (CD 9 – 11).	Type II
9 – 12	III	If the orthopedic surgeon is not dedicated to a single facility while on call, then a published backup schedule is required (CD 9 – 12).	Type II
9 – 13	III	The PIPS process must review the appropriateness of the decision to transfer or retain major orthopedic trauma cases (CD 9 – 13).	Type II
9 – 15	III	The orthopedic service must participate actively with the overall trauma PIPS program and the multidisciplinary trauma peer review committee (CD 9 – 15).	Type IIB
9 – 16	III	The orthopedic liaison to the trauma PIPS program must attend a minimum of 50 percent of the multidisciplinary trauma peer review committee meetings (CD 9 – 16).	Type II
9 – 17	III	Board certification or eligibility for certification by an appropriate orthopedic board according to the current requirements, or the alternate pathway is essential for orthopedic surgeons who take trauma call in Level III trauma centers (CD 9 – 17).	Type II
9 (6-3)	III	Alternate Criteria (CD 6 – 3) for Non-Board-Certified Orthopedic Surgeons in a Level III Trauma Center.	Type II

Chapter 10: Pediatric Trauma Care

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 11: Collaborative Clinical Services			
11 – 1	III	Anesthesia services are critical in the management of severely injured patients and must be available within 30 minutes for emergency operations (CD 11 – 1).	Type I
11 – 2	III	Anesthesiology services are critical in the management of severely injured patients and must be available within 30 minutes for managing airway problems (CD 11 – 2).	Type I
11 – 3	III	In Level III trauma centers, a qualified and dedicated physician anesthesiologist must be designated as the liaison to the trauma program (CD 11 – 3).	Type I
11 – 6	III	The availability of anesthesia services and delays in airway control or operations must be documented by the hospital performance improvement and patient safety (PIPS) process (CD 11 – 6).	Type II
11 – 7	III	In Level III hospitals, in-house anesthesia services are not required, but anesthesiologists or CRNAs must be available within 30 minutes (CD 11 – 7).	Type I
11 – 8	III	In Level III trauma centers without in-house anesthesia services, protocols must be in place to ensure the timely arrival at the bedside by the anesthesia provider within 30 minutes of notification and request (CD 11 – 8).	Type I
11 – 9	III	Under these circumstances, the presence of a physician skilled in emergency airway management must be documented (CD 11 – 9).	Type I
11 – 12	III	In Level III trauma centers participation in the trauma PIPS program by the anesthesia liaison is essential (CD 11 – 12).	Type IIB
11 – 13	III	The anesthesiology liaison to the trauma program must attend at least 50 percent of the multidisciplinary peer review meetings, with documentation by the trauma PIPS program (see Chapter 16, Performance Improvement and Patient Safety) (CD 11 – 13).	Type II

11 – 14	III	In Level III trauma centers, an operating room must be adequately staffed and available within 30 minutes (CD 11 – 17).	Type I
11 – 15	III	If an on-call team is used, the availability of operating room personnel and the timeliness of starting operations must be continuously evaluated by the trauma PIPS process, and measures must be implemented to ensure optimal care (CD 11 – 18).	Type II
11 – 19	III	All trauma centers must have rapid fluid infusers, thermal control equipment for patients and resuscitation fluids, intraoperative radiologic capabilities, equipment for fracture fixation, and equipment for bronchoscopy and gastrointestinal endoscopy (CD 11 – 19).	Type I
11 – 20	III	Level III trauma centers must have the necessary equipment to perform a craniotomy (CD 11 – 20). Only Level III trauma centers that do not offer neurosurgery services are not required to have craniotomy equipment.	Type I
11 – 24	III	At Level III trauma centers, a PACU with qualified nurses must be available 24 hours per day to provide care for the patient if needed during the recovery phase (CD 11 – 24).	Type I
11 – 25	III	If this availability requirement is met with a team on call from outside the hospital, the availability of the PACU nurses and compliance with this requirement must be documented by the PIPS program (CD 11 – 25).	Type II
11 – 26	III	The PACU must have the necessary equipment to monitor and resuscitate patients, consistent with the process of care designated by the institution (CD 11 – 26).	Type I
11 – 27	III	The PIPS program, at a minimum, must address the need for pulse oximetry, end-tidal carbon dioxide detection, arterial pressure monitoring, pulmonary artery catheterization, patient re-warming, and intracranial pressure monitoring (CD 11 – 27).	Type II
11 – 28	III	The trauma center must have policies designed to ensure that trauma patients who may require resuscitation and monitoring are accompanied by appropriately trained providers during transportation to, and while in, the radiology department (CD 11 – 28).	Type II
11 – 29	III	Conventional radiography must be available in all trauma centers 24 hours per day (CD 11 – 29).	Type I
11 – 30	III	Computed tomography (CT) must be available in Level III trauma centers 24 hours per day (CD 11 – 30).	Type I
11 – 32	III	In Level III trauma centers, qualified radiologists must be available within 30 minutes in person or by tele-radiology for the interpretation of radiographs (CD 11 – 32).	Type I
11 – 34	III	In Level III trauma centers diagnostic information must be communicated in a written or electronic form and in a timely manner (CD 11 – 34).	Type II
11 – 35	III	Critical information deemed to immediately affect patient care must be verbally communicated to the trauma team in a timely manner (CD 11 – 35).	Type II
11 – 36	III	The final report must accurately reflect the chronology and content of communications with the trauma team, including changes between the preliminary and final interpretations (CD 11 – 36).	Type II
11 – 37	III	Changes in interpretation between preliminary and final reports, as well as missed injuries, must be monitored through the PIPS program (CD 11 – 37).	Type II

11 – 47	III	In Level III centers, if the CT technologist takes call from outside the hospital, the PIPS program must document the technologists time of arrival at the hospital (CD 11 – 47).	Type II
11 – 53	III	In Level III trauma centers, a surgeon must serve as co-director or director of the ICU and be actively involved in, and responsible for, setting policies and administrative decisions related to trauma ICU patients (CD 11 – 53).	Type II
11 – 54	III	In Level III facilities, the ICU director or co-director must be a surgeon who is currently board certified or eligible for certification by the current standard requirements (CD 11 – 54).	Type II
11 – 56	III	In Level III trauma centers, physician coverage of the ICU must be available within 30 minutes, with a formal plan in place for emergency coverage (CD 11 – 56).	Type I
11 – 57	III	In Level III trauma centers, the PIPS program must review all ICU admissions and transfers of ICU patients to ensure that appropriate patients are being selected to remain at the Level III center vs. being transferred to a higher level of care (CD 11 – 57).	Type II
11 – 58	III	In Level III trauma centers, the trauma surgeon must retain responsibility for the patient and coordinate all therapeutic decisions (CD 11 – 58).	Type I
11 – 59	III	Many of the daily care requirements can be collaboratively managed by a dedicated ICU team, but the trauma surgeon must e kept informed and concur with major therapeutic and management decisions made by the ICU team (CD 11 – 59).	Type I
11 – 60	III	For all levels of trauma centers, the timely response of credentialed providers to the ICU must be continuously monitored as part of the PIPS program (CD 11 – 60).	Type II
11 – 60	III	In all Level I, II, and III trauma centers, the timely response of credentialed providers to the ICU must be continuously monitored as part of the PIPS program (CD 11 – 60)	Type II
11 – 61	III	There must be a designated ICU liaison to the trauma service (CD 11 – 61).	Type II
11 – 62	III	The ICU liaison must attend at least 50 percent of the multidisciplinary peer review meetings, with documentation by the trauma PIPS program (CD 11 – 62).	Type II
11 – 65	III	At Level I, II, and III trauma centers, qualified critical care nurses must be available 24 hours per day to provide care for patients during the ICU phase (CD 11 – 65).	Type I
11 – 66	III	The patient-to-nurse ratio in the ICU must not exceed two to one (CD 11 – 66).	Type II
11 – 67	III	The ICU must have the necessary equipment to monitor and resuscitate patients (CD 11 – 67).	Type I
11 – 68	III	Intracranial pressure monitoring equipment must be available in Level I and II trauma centers and in Level III trauma centers with neurosurgical coverage that admit neurotrauma patients (CD 11 – 68).	Type I
11 – 69	III	Trauma patients must not be admitted or transferred by a primary care physician without the knowledge and consent of the trauma service, and the PIPS program should monitor adherence to this guideline (CD 11 – 69).	Type IIB
11 – 72	III	Level III trauma centers must have the availability and commitment of orthopedic surgeons (CD 11 – 72).	Type I
11	III	For all patients being transferred for specialty care, such as burn care, microvascular surgery, cardiopulmonary bypass capability, complex ophthalmologic surgery, or high-complexity pelvic fractures, agreements with a	Type II

		similar or higher-qualified verified trauma center should be in place. If this approach is used, a clear plan for expeditious critical care transport, follow-up, and performance monitoring is required (CD 8 – 5). If complex cases are being transferred out, a contingency plan should be in place and must include the following: • A credentialing process to allow the trauma surgeon to provide initial evaluation and stabilization of the patient. • Transfer agreements with similar or higher-verified trauma centers. • Direct contact with the accepting facility to arrange for expeditious transfer or ongoing monitoring support. • Monitoring of the efficacy of the process by the PIPS programs.	
11 – 74	III	In a Level III facility, internal medicine specialists must be available on the medical staff (CD 11 – 74).	Type II
11 – 76	III	In Level III centers, there must be a respiratory therapist on call 24 hours per day (CD 11 -76).	Type I
11 – 78	III	Level III trauma centers that do not have dialysis capabilities must have a transfer agreement in place (CD 11 – 78).	Type II
11 – 80	III	In trauma centers of all levels, laboratory services must be available 24 hours per day for the standard analyses of blood, urine, and other body fluids, including micro-sampling when appropriate (CD 11 -80).	Type I
11 – 81	III	The blood bank must be capable of blood typing and cross-matching (CD 11 – 81).	Type I
11 – 83	III	In Level III centers, the blood bank must have an adequate supply of packed red blood cells and fresh frozen plasma available within 15 minutes (CD 11 – 83).	Type I
11 – 84	III	Trauma centers of all levels must have a massive transfusion protocol developed collaboratively between the trauma service and the blood bank (CD 11 – 84).	Type I
11 – 85	III	Coagulation studies, blood gas analysis, and microbiology studies must be available 24 hours per day (CD 11 – 85).	Type I
11 – 86	III	Advanced practitioners who participate in the initial evaluation of trauma patients must demonstrate current verification s an Advanced Trauma Life Support® provider (CD 11 – 86).	Type II
11 – 87	III	The trauma program must also demonstrate appropriate orientation, credentialing processes, and skill maintenance for advanced practitioners, as witnessed by an annual review by the trauma medical director (CD 11 – 87).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 12: Rehabilitation			
12 – 3	III	Physical therapy (CD 12 – 3) must be provided in Level III trauma centers.	Type I
12 – 4	III	Social services (CD 12 – 4) must be provided in Level III trauma centers.	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 13: Rural Trauma Care			
13(4-1)	III	Direct contact of the physician or midlevel provider with a physician at the receiving hospital is essential (CD 4 – 1).	Type II
13(2-13)	III	Transfer guidelines and agreements between facilities are crucial and must be developed after evaluating the capabilities of rural hospitals and medical transport agencies (CD 2 – 13).	Type II
13 (4-3)	III	All transfers must be evaluated as part of the receiving trauma center's performance improvement and patient safety (PIPS) process (CD 4 – 3), and feedback should be provided to the transferring center.	Type II
13(15-1)	III	The foundation for evaluation of a trauma system is the establishment and maintenance of a trauma registry (CD 5- 1).	Type II
13	III	Issues that must be reviewed will revolve predominately around (1) system and process issues such as documentation and communication; (2) clinical care, including identification and treatment of immediate life-threatening injuries (ATLS®); and (3) transfer decisions (CD 16 – 10).	Type II
13(1-1)	III	The best possible care for patients must be achieved with a cooperative and inclusive program that clearly defines the role of each facility within the system (CD 1 – 1).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 14: Guidelines for the Operation of Burn Centers			
14 – 1	III	Trauma centers that refer burn patients to a designated burn center must have in place written transfer agreements with the referral burn center (CD 14 – 1).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 15: Trauma Registry			
15 – 1	III	Trauma registry data must be collected and analyzed by every trauma center (CD 15 – 1).	Type II
15 – 2	III	Finally, these data must be collected in compliance with the National Trauma Data Standard (NTDS) and submitted to the National Trauma Data Bank® (NTDB®) every year in a timely fashion so that they can be aggregated and analyzed at the national level (CD 15 – 2).	Type II
15 – 3	III	The trauma registry is essential to the performance improvement and patient safety (PIPS) program and must be used to support the PIPS process (CD 15 – 3).	Type IIB
15 – 4	III	Furthermore, these findings must be used to identify injury prevention priorities that are appropriate for local implementation (CD 15 – 4).	Type II
15 – 5	III	All trauma centers must use a risk adjusted benchmarking system to measure performance and outcomes (CD 15 – 5).	Type II
15 – 6	III	Trauma registries should be concurrent. At a minimum, 80 percent of cases must be entered within 60 days of discharge (CD 15 -6).	Type II
15 – 7	III	[Registrar] They must attend or have previously attended two courses within 12 months of being hired: (1) the American Trauma Society's Trauma Registrar Course or equivalent provided by a state trauma program; and (2) the	Type II

		Association of the Advancement of Automotive Medicine's Injury Scaling Course (CD 15 – 7).	
15 – 8	III	The trauma program must ensure that appropriate measures are in place to meet the confidentiality requirements of the data (CD 15 – 8).	Type II
15 – 9	III	One full-time equivalent employee dedicated to the registry must be available to process the data capturing the NTDS data set for each 500-750 admitted patients annually (CD 15-9).	Type II
15 – 10	III	Strategies for monitoring data validity are essential (CD 15 – 10).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 16: Performance Improvement and Patient Safety			
16 – 1	III	Trauma centers must have a PIPS program that includes a comprehensive written plan outlining the configuration and identifying both adequate personnel to implement that plan and an operational data management system (CD 16 – 1).	Type IIB
16 (15-1)	III	The PIPS program must be supported by a reliable method of data collection that consistently obtains the information necessary to identify opportunities for improvement (CD 15 – 1).	Type II
16 (2-17)	III	The processes of event identification and levels of review must result in the development of corrective action plans, and methods of monitoring, reevaluation, and benchmarking must be present (CD 2 – 17).	Type II
16 – 2	III	Problem resolution, outcome improvements, and assurance of safety ("loop closure") must be readily identifiable through methods of monitoring, reevaluation, benchmarking, and documentation (CD 16 – 2)	Type IIB
16 (2-18)	III	Peer review must occur at regular intervals to ensure that the volume of cases is reviewed in a timely fashion (CD 2 – 18).	Type II
16 – 3	III	The trauma PIPS program must integrate with the hospital quality and patient safety effort and have a clearly defined reporting structure and method for provision of feedback (CD 16 – 3).	Type II
16 (5-1)	III	Because the trauma PIPS program crosses many specialty lines, it must be empowered to address events that involve multiple disciplines and be endorsed by the hospital governing body as part of its commitment to optimal care of injured patients (CD 5 – 1).	Type I
16 (5-1)	III	There must be adequate administrative support to ensure evaluation of all aspects of trauma care (CD 5 – 1).	Type I
16 (5-1)	III	The trauma medical director and the trauma program manager must have the authority and be empowered by the hospital governing body to lead the program (CD 5 – 1).	Type I
16 (5-11)	III	The trauma medical director must have sufficient authority to set the qualifications for the trauma service members, including individuals in specialties that are routinely involved with the care of the trauma patient (CD 5 – 11).	Type II
16 (5-11)	III	Moreover, the trauma medical director must have authority to recommend changes for the trauma panel passed on performance review (CD 5 – 110.	Type II
16 (5-25)	III	The peer review committee must be chaired by the TMD (CD 5 – 25).	Type II

16	III	In level III trauma centers, representation from general surgery (CD 6 – 8), and liaisons to the trauma program from emergency medicine (CD 7 – 11)., orthopedics (CD 9 – 16), and anesthesiology (CD 11 – 13), critical care (CD 11 – 62) must be identified and participate actively in the trauma PIPS program with at least 50 percent attendance at multidisciplinary trauma peer review committee.	Type II
16 (8-13)	III	Level III centers with any emergent neurosurgical cases must also have the participation of neurosurgery on the multidisciplinary trauma peer review committee (CD 8 – 13).	Type II
16 (15-1)	III	The trauma center must demonstrate that all trauma patients can be identified for review (CD 15 – 1).	Type II
16 (15-2)	III	In Level III trauma centers, the trauma registry must submit the required data elements to the NTDB (CD 15 – 2).	Type II
16 (15-3)	III	The trauma PIPS program must be supported by a registry and a reliable method of concurrent data collection that consistently obtains information necessary to identify opportunities for improvement (CD 15 – 3).	Type II
16 (15-5)	III	All trauma centers must use a risk adjusted benchmarking system to measure performance and outcomes (CD 15 – 5).	Type II
16 – 4	III	To achieve this goal, a trauma program must use clinical practice guidelines, protocols, and algorithms derived from evidenced-based validated resources (CD 16 – 4).	Type IIB
16 – 5	III	All process and outcome measures must be documented within the trauma PIPS program's written plan and reviewed and updated at least annually (CD 16 – 5).	Type II
16 – 6	III	Mortality Review (CD 16 – 6). All trauma-related mortalities must be systematically reviewed and those mortalities with opportunities for improvement identified for peer review. 1. Total trauma-related mortality rates. Outcome measures for total, pediatric (younger than 15 years), and geriatric (older than 64 years) trauma encounters should be categorized as follows: a) DOA (pronounced dead on arrival with no additional resuscitation efforts initiated in the emergency department). b) DIED (died in the emergency department despite resuscitation efforts). c) In-hospital (including operating room). 2. Mortality rates by Injury Severity Scale (ISS) subgroups using Table 1.	Type IIB
16 (2-9)	III	Trauma surgeon response to the emergency department (CD 2 – 9). See previous detail.	Type II
16 (5-13)	III	Trauma team activation (TTA) criteria (CD 5 – 13). See previous detail.	Type II
16	III	All Trauma Team Activations must be categorized by the level of response and quantified by number and percentage, as shown in Table 2 (CD 5 – 14, CD 5 – 15).	Type II
16 (5-16)	III	Trauma surgeon response time to other levels of TTA, and for back-up call response, should be determined and monitored. Variances should be documented and reviewed for reason for delay, opportunities for improvement, and corrective actions (CD 5 – 16).	Type II

16 (5-16)	III	Response parameters for consultants addressing time-critical injuries (for example, epidural hematoma, open fractures, and hemodynamically unstable pelvic fractures) must be determined and monitored (CD 5 – 16).	Type II
16 – 7	III	Rates of undertriage and overtriage must be monitored and reviewed quarterly (CD 16 – 7).	Type II
16 (5-18)	III	Trauma patient admissions (NTDS definition) to a nonsurgical service is higher than 10 percent (CD 5 – 18).	Type II
16	III	Acute transfers out (CD 9 – 14). All trauma patients who are diverted (CD 3 – 4) or transferred (CD 4 – 3) during the acute phase of hospitalization to another trauma center, acute care hospital, or specialty hospital (for example, burn center, preimplantation center, or pediatric trauma center) or patients requiring cardiopulmonary bypass or when specialty personnel are unavailable must be subjected to individual case review to determine the rationale for transfer, appropriateness of care, and opportunities for improvement. Follow-up from the center to which the patient was transferred should be obtained as part of the case review.	Type II
16	III	Emergency physicians covering in-house emergencies at Level III trauma centers (CD 7 – 3). See previous detail.	Type II
16	III	Trauma center diversion-bypass hours must be routinely monitored, documented, and reported, including the reason for initiating the diversion policy (CD 3 – 6), and must not exceed 5 percent.	Type II
16	III	Appropriate neurosurgical care at Level III trauma centers (CD 8 – 9).	Type II
16	III	Availability of the anesthesia service (CD 11 – 4, CD 11 – 7, CD 11 – 16, CD 11 – 18). • In-house anesthesia service (emergency department, intensive care unit, floor, and post-anesthesia care unit) must be available for the care of trauma patients • Operating room delays involving trauma patients because of lack of anesthesia support services must be identified and reviewed to determine the reason for delay, adverse outcomes, and opportunities for improvement.	Type II
16	III	Delay in operating room availability (CD 11 – 16, CD 11 – 18) must be routinely monitored. Any case that is associated with a significant delay or adverse outcome must be reviewed for reason for delay and opportunities for improvement.	Type II
16	III	Response times of operating room and post-anesthesia care unit personnel when responding from outside the trauma center (CD 11 – 16, CD 11 – 18, CD 11 – 25) must be routinely monitored.	Type II
16	III	Rate of change in interpretation of radiologic studies (CD 11 – 32, CD 11 – 37) should be categorized by RADPEER or similar criteria (describe process/scoring metric used).	Type I
16	III	Response times of computed tomography technologist (30 minutes)/magnetic resonance imaging (60 minutes) technologist/interventional radiology team (30) minutes when responding from outside the trauma center (CD 11 – 29, Cd 1 – 30, CD 11 – 31, CD 11 – 32, CD 11 – 33, CD 11 – 34, CD 11 – 35, CD 11 – 36, CD – 37, and CD 11 – 46).	Type I
16 – 8	III	Transfer to a higher level of care within the institution (CD 16 – 8).	Type II
16 – 9	III	Solid organ donation rate (CD 16 – 9).	Type II

16	III	Trauma registry (CD 15 – 6). See previous detail.	Type I
16	III	Multidisciplinary trauma peer review committee attendance. (Level III, CD 5 – 10, CD 6 – 8, CD 7 – 11, CD 9 – 16, CD 11 -13, CD 11 – 62 – and for Level I and II CD 8 – 13 and Cd 11 – 39).	Type II
16 – 10	III	Sufficient mechanisms must be available to identify events for review by the trauma PIPS program (CD 16 – 10).	Type IIB
16 – 11	III	Once an even is identified, the trauma PIPS program must be able to verify and validate that event (CD 16 – 11).	Type IIB
16 – 12	III	There must be a process to address trauma program operational events (CD 16 – 12).	Type IIB
16 – 13	III	Documentation (minutes) reflects the review of operational events and, when appropriate, the analysis and proposed corrective actions (CD 16 – 13).	Type I
16 – 14	III	Mortality data, adverse events and problem trends, and selected cases involving multiple specialties must undergo multidisciplinary trauma peer review (CD 16 – 14).	Type IIB
16	III	The effort may be accomplished in a variety of formats but must involve the participation and leadership of the trauma medical directory (CD 5 – 10); the group of general surgeons on the call panel; and the liaisons from emergency medicine, orthopedics, neurosurgery, anesthesia, critical care, and radiology (Level III, CD 6 – 8, CD 7 – 11, CD 9 – 16, CD 11 – 13, CD 11 – 62).	Type II
16 – 15	III	Each member of the committee must attend at least 50 percent of all multidisciplinary trauma peer review committee meetings (CD 16 – 15).	Type II
16 – 16	III	When these general surgeons cannot attend the multidisciplinary trauma peer review meeting, the trauma medical director must ensure that they receive and acknowledge the receipt of critical information generated at the multidisciplinary peer review meeting to close the loop (CD 16 – 16).	Type II
16 – 17	III	The multidisciplinary trauma peer review committee must systematically review mortalities, significant complications, and process variances associated with unanticipated outcomes and determine opportunities for improvement (CD 16 – 17).	Type IIB
16 – 18	III	When an opportunity for improvement is identified, appropriate corrective actions to mitigate or prevent similar future adverse events must be developed, implemented, and clearly documented by the trauma PIPS program (CD 16 – 18).	Type IIB
16 – 19	III	An effective performance improvement program demonstrates through clear documentation that identified opportunities for improvement lead to specific interventions that result in an alteration in conditions such that similar adverse events are less likely to occur (CD 16 – 19).	Type IIB

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 17: Outreach and Education			
17 – 1	III	All verified trauma centers, however, must engage in public and professional education (CD 17 – 1).	Type II
17 – 4	III	In Level I, II, and III trauma centers, the hospital must provide a mechanism to offer trauma-related education to nurses involved in trauma care (CD 17 – 4).	Type II
17	III	The successful completion of the ATLS® course, at least once, is required in all levels of trauma centers for all general surgeons (CD 6 – 9), emergency	Type II

		medicine physicians (CD 7 – 14), and midlevel providers (CD 11 – 86) on the trauma team.	

Chapter 18: Prevention			
18 – 1	III	Trauma centers must have an organized and effective approach to injury prevention and must prioritize those efforts based on local trauma registry and epidemiologic data (CD 18 – 1).	Type II
18 – 2	III	Each trauma center must have someone in a leadership position that has injury prevention as part of his or her job description (CD 18 – 2).	Type II
18 – 3	III	Universal screening for alcohol use must be performed for all injured patients and must be documented (CD 18 – 3).	Type II

Chapter 19: Trauma Research and Scholarship

Chapter 20: Disaster Planning and Management			
20 – 1	III	Trauma centers must meet the disaster-related requirements of the Joint Commission (CD 20 – 1).	Type II
20 – 2	III	A surgeon from the trauma panel must be a member of the hospital's disaster committee (CD 20 – 2).	Type II
20 – 3	III	Hospital drills that test the individual hospital's disaster plan must be conducted at least twice a year, including actual plan activations that can substitute for drills (CD 20 – 3).	Type II
20 – 4	III	All trauma centers must have a hospital disaster plan described in the hospital's policy and procedure manual or equivalent (CD 20 – 4).	Type II

Chapter 21: Solid Organ Procurement Activities			
21 – 1	III	The trauma center must have an established relationship with a recognized OPO (CD 21 – 1).	Type II
21 – 2	III	A written policy must be in place for triggering notification of the regional OPO (CD 21 – 2).	Type II
21 – 3	III	The trauma center must review its solid organ donation rate annually (CD 16 – 9)	Type II
21 – 4	III	It is essential that each trauma center have written protocols defining the clinical criteria and confirmatory tests for the diagnosis of brain death (CD21 – 3).	Type II

Chapter 22: Verification, Review, & Consultation Program

Chapter 23: Criteria quick Reference Guide

Level IV Criteria for verification are adopted by reference into Iowa Administrative Code from the *Resources for the Optimal Care of the Injured Patient (*ACS-COT, 2014).

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 1: Trauma Systems			
1 - 1	IV	The individual trauma centers and their health care providers are essential system resources that must be active and engaged participants (CD 1 – 1).	Type II
1 - 2	IV	They must function in a way that pushes trauma center-based standardization, integration, and PIPS out to the region while engaging in inclusive trauma system planning and development (CD 1-2).	Type II
1 - 3	IV	Meaningful involvement in state and regional trauma system planning, development, and operation is essential for all designated trauma centers and participating acute care facilities within a region (CD 1-3).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 2: Description of Trauma Centers and Their Roles In a Trauma System			
2 – 1	IV	This trauma center must have an integrated, concurrent performance improvement and patient safety (PIPS) program to ensure optimal care and continuous improvement In care (CD 2 – 1).	Type I
2 – 3	IV	Trauma centers must be able to provide the necessary human and physical resources (physical plant and equipment) to properly administer acute care consistent with their level of verification (CD 2 – 2).	Type IIB
2 – 8	IV	For Level IV trauma centers, it is expected that the physician (if available) or midlevel provider will be in the emergency department on patient arrival, with adequate notification from the field. The maximum acceptable response time is 30 minutes for the highest level of activation, tracked from patient arrival. The PIPS program must demonstrate that the physician's (if available) or midlevel provider's presence is in compliance at least 80 percent of the time (CD 2 – 8).	Type I
2 – 13	IV	Well-defined transfer plans are essential (CD 2 – 13).	Type II
2 – 13	IV	Collaborative treatment and transfer guidelines reflecting the Level IV facilities' capabilities must be developed and regularly reviewed, with input from higher-level trauma centers in the region (CD 2 – 13).	
2 – 14	IV	A Level IV facility must have 24-hour emergency coverage by a physician or midlevel provider (CD 2 – 14).	Type II
2 – 15	IV	The emergency department at Level IV centers must be continuously available for resuscitation with coverage by a registered nurse and physician or midlevel provider, and it must have a physician director (CD 2 – 15).	Type II
2 – 16	IV	These providers must maintain current Advanced Trauma Life Support® certification as part of their competencies in trauma (CD 2 – 16).	Type II
2 – 17	IV	For Level IV trauma centers a trauma medical director and trauma program manager knowledgeable and involved in trauma care must work together with guidance from the trauma peer review committee to identify events, develop corrective action plans, and ensure methods of monitoring, reevaluation, and benchmarking (CD 2 – 17).	Type IIB
2 – 18	IV	Level IV trauma centers the multidisciplinary trauma peer review committee must meet regularly, with required attendance of medical staff active in trauma	Type IIB

		resuscitation, to review systemic and care provider issues, as well as propose improvements to the care of the injured (CD 2 – 18).	
2 – 19	IV	Level IV trauma centers a PIPS program must have audit filters to review and improve pediatric and adult patient care (CD 2 – 19).	Type II
2 – 20	IV	Because of the greater need for collaboration with receiving trauma centers, the Level IV trauma center must also actively participate in regional and statewide trauma system meetings and committees that provide oversight (CD 2 – 20).	Type II
2 – 21	IV	The Level IV trauma center must also be the local trauma authority and assume the responsibility for providing training for prehospital and hospital-based providers (CD 2 – 21).	Type II
2 - 22	IV	Level IV trauma centers must participate in regional disaster management plans and exercises (CD 2 – 22).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 3: Prehospital Trauma Care			
3 – 1	IV	The trauma program must participate in the training of prehospital personnel, the development and improvement of prehospital care protocols, and the performance improvement an patient safety programs (CD 3 – 1)	Type II
3 – 2	IV	The protocols that guide prehospital trauma care must be established by the trauma health care team, including surgeons, emergency physicians, medical directors for EMS agencies, and basic and advanced prehospital personnel (CD 3-2).	Type II
3 – 7	IV	When a trauma center is required to go on bypass or to divert, the center must have a system to notify dispatch and EMS agencies (CD 3 – 7). The center must do the following: • Prearrange alternative destinations with transfer agreements in place • Notify other centers of divert or advisory status • Maintain a divert log • Subject all diverts and advisories to performance improvement procedures	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 4: Inter-hospital Transfer			
4 - 1	IV	Direct physician-to-physician contact is essential (CD 4 – 1).	Type II
4 - 3	IV	A very important aspect of inter-hospital transfer is an effective PIPS program that includes evaluating transport activities (CD 4 – 3).	Type II
4 - 3	IV	Perform a PIPS review of all transfers (CD 4 – 3).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 5: Hospital Organization and the Trauma Program			
5 – 1	IV	A decision by a hospital to become a trauma center requires the commitment of the institutional governing body and the medical staff (CD 5 – 1)	Type I

5 – 1	IV	Documentation of administrative commitment is required from the governing body and the medical staff (CD 5 – 1).	Type I
5 – 13	IV	The criteria for a graded activation must be clearly defined by the trauma center, with the highest level of activation including the six required criteria listed in Table 2 (CD 5 – 13).	Type II
5 – 15	IV	In Level III trauma centers the team must be fully assembled within 30 minutes (CD 5 – 15).	Type II
5 – 16	IV	Other potential criteria for trauma team activation that have been determined by the trauma program to be included in the various levels of trauma activation must be evaluated on an ongoing basis in the PIPS process (CD 5 – 16) to determine their positive predictive value in identifying patients who require the resources of the full trauma team.	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 6: Clinical Functions: General Surgery			
6	IV	For Level IV trauma centers, the maximum acceptable response time is 30 minutes. Response time will be tracked from patient arrival rather than from notification or activation. An 80 percent attendance threshold must be met for the highest-level activations (CD 2 – 8).	Type I

Chapter 7: Clinical Functions: Emergency Medicine

Chapter 8: Clinical Functions: Neurosurgery

Chapter 9: Clinical Functions: Orthopedic Surgery

Chapter 10: Clinical Functions: Pediatric Trauma Care

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 11: Collaborative Clinical Services			
11 – 29	IV	Conventional radiography must be available in all trauma centers 24 hours per day (CD 11 – 29).	Type I
11 – 80	IV	In trauma centers of all levels, laboratory services must be available 24 hours per day for the standard analyses of blood, urine, and other body fluids, including micro-sampling when appropriate (CD 11 – 80)	Type I
11 – 81	IV	The blood bank must be capable of blood typing and cross-matching (CD 11 – 81).	Type I
11 – 84	IV	Trauma centers of all levels must have a massive transfusion protocol developed collaboratively between the trauma service and the blood bank (CD 11 – 84).	Type I

11 – 86	IV	Advanced practitioners who participate in the initial evaluation of trauma patients must demonstrate current verification as an Advanced Trauma Life Support® provider. (CD 11 – 86).	Type II
11 – 87	IV	The trauma program must also demonstrate appropriate orientation, credentialing processes and skill maintenance for advanced practitioners, as witnessed by an annual review by the trauma medical director (CD 11 – 87).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 13: Rural Trauma Care			
13(4-1)	IV	Direct contact of the physician or midlevel provider with a physician at the receiving hospital is essential (CD 4 – 1).	Type II
13(2-13)	IV	Transfer guidelines and agreements between facilities are crucial and must be developed after evaluating the capabilities of rural hospitals and medical transport agencies (CD 2 – 13).	Type II
13 (4-3)	IV	All transfers must be evaluated as part of the receiving trauma center's performance improvement and patient safety (PIPS) process (CD 4 – 3), and feedback should be provided to the transferring center.	Type II
13(15-1)	IV	The foundation for evaluation of a trauma system is the establishment and maintenance of a trauma registry (CD 5- 1).	Type II
13(16-10)	IV	Issues that must be reviewed will revolve predominately around (1) system and process issues such as documentation and communication; (2) clinical care, including identification and treatment of immediate life-threatening injuries (ATLS®); and (3) transfer decisions (CD 16 – 10).	Type II
13(1-1)	IV	The best possible care for patients must be achieved with a cooperative and inclusive program that clearly defines the role of each facility within the system (CD 1 – 1).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 14: Guidelines for the Operation of Burn Centers			
14 – 1	IV	Trauma centers that refer burn patients to a designated burn center must have in place written transfer agreements with the referral burn center (CD 14 – 1).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 15: Trauma Registry			
15 – 1	IV	Trauma registry data must be collected and analyzed by every trauma center (CD 15 – 1).	Type II
15 – 3	IV	The trauma registry is essential to the performance improvement and patient safety (PIPS) program and must be used to support the PIPS process (CD 15 – 3).	Type IIB
15 – 4	IV	Furthermore, these findings must be used to identify injury prevention priorities that are appropriate for local implementation (CD 15 – 4).	Type II
15 – 6	IV	Trauma registries should be concurrent. At a minimum, 80 percent of cases must be entered within 60 days of discharge (CD 15 -6).	Type II

15 – 8	IV	The trauma program must ensure that appropriate measures are in place to meet the confidentiality requirements of the data (CD 15 – 8).	Type II
15 – 10	IV	Strategies for monitoring data validity are essential (CD 15 – 10).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 16: Performance Improvement and Patient Safety			
16 (15-1)	IV	The PIPS program must be supported by a reliable method of data collection that consistently obtains the information necessary to identify opportunities for improvement (CD 15 – 1).	Type II
16 (2-17)	IV	The processes of event identification and levels of review must result in the development of corrective action plans, and methods of monitoring, reevaluation, and benchmarking must be present (CD 2 – 17).	Type II
16 (2-18)	IV	Peer review must occur at regular intervals to ensure that the volume of cases is reviewed in a timely fashion (CD 2 – 18).	Type II
16 (5-1)	IV	Because the trauma PIPS program crosses many specialty lines, it must be empowered to address events that involve multiple disciplines and be endorsed by the hospital governing body as part of its commitment to optimal care of injured patients (CD 5 – 1).	Type I
16 (5-1)	IV	There must be adequate administrative support to ensure evaluation of all aspects of trauma care (CD 5 – 1).	Type I
16 (5-1)	IV	The trauma medical director and the trauma program manager must have the authority and be empowered by the hospital governing body to lead the program (CD 5 – 1).	Type I
16 (15-1)	IV	The trauma center must demonstrate that all trauma patients can be identified for review (CD 15 – 1)	Type II
16 (15-3)	IV	The trauma PIPS program must be supported by a registry and a reliable method of concurrent data collection that consistently obtains information necessary to identify opportunities for improvement (CD 15 – 3).	Type II
16 – 5	IV	All process and outcome measures must be documented within the trauma PIPS program's written plan and reviewed and updated at least annually (CD 16 – 5).	Type II
16 (2-9)	IV	Trauma surgeon response to the emergency department (CD 2 – 9). See previous detail.	Type II
16 (5-13)	IV	Trauma team activation (TTA) criteria (CD 5 – 13). See previous detail.	Type II
16	IV	All Trauma Team Activations must be categorized by the level of response and quantified by number and percentage, as shown in Table 2 (CD 5 – 14, CD 5 – 15).	Type II
16 (5-16)	IV	Response parameters for consultants addressing time-critical injuries (for example, epidural hematoma, open fractures, and hemodynamically unstable pelvic fractures) must be determined and monitored (CD 5 – 16).	Type II
16	IV	Acute transfers out (CD 9 – 14). All trauma patients who are diverted (CD 3 – 4) or transferred (CD 4 – 3) during the acute phase of hospitalization to another trauma center, acute care hospital, or specialty hospital (for example, burn center, preimplantation center, or pediatric trauma center) or patients requiring cardiopulmonary bypass or when specialty personnel are unavailable must be subjected to individual case review to determine the rationale for transfer, appropriateness of care, and opportunities for improvement. Follow-	Type II

		up from the center to which the patient was transferred should be obtained as part of the case review.	
16 – 8	IV	Transfer to a higher level of care within the institution (CD 16 – 8).	Type II
16	IV	Trauma registry (CD 15 – 6). See previous detail.	Type II
16 – 10	IV	Sufficient mechanisms must be available to identify events for review by the trauma PIPS program (CD 16 – 10).	Type IIB
16 – 11	IV	Once an even is identified, the trauma PIPS program must be able to verify and validate that event (CD 16 – 11).	Type II

Chapter	Level	Criterion: Chapter - Level	Type
Chapter 17: Outreach and Education			
17 – 1	IV	All verified trauma centers, however, must engage in public and professional education (CD 17 – 1).	Type II
17	IV	The successful completion of the ATLS® course, at least once, is required in all levels of trauma centers for all general surgeons (CD 6 – 9), emergency medicine physicians (CD 7 – 14), and midlevel providers (CD 11 – 86) on the trauma team.	Type II
Chapter 18: Prevention			
18 – 1	IV	Trauma centers must have an organized and effective approach to injury prevention and must prioritize those efforts based on local trauma registry and epidemiologic data (CD 18 – 1).	Type II
18 – 2	IV	Each trauma center must have someone in a leadership position that has injury prevention as part of his or her job description (CD 18 – 2).	Type II
18 – 3	IV	Universal screening for alcohol use must be performed for all injured patients and must be documented (CD 18 – 3).	Type II
Chapter 19: Trauma research and Scholarship			
Chapter 20: Disaster Planning and Management			
20 – 1	IV	Trauma centers must meet the disaster-related requirements of the Joint Commission (CD 20 – 1).	Type II
20 – 3	IV	Hospital drills that test the individual hospital's disaster plan must be conducted at least twice a year, including actual plan activations that can substitute for drills (CD 20 – 3).	Type II
20 – 4	IV	All trauma centers must have a hospital disaster plan described in the hospital's policy and procedure manual or equivalent (CD 20 – 4).	Type II
Chapter 21: Solid Organ Procurement Activities			
21 – 3	IV	It is essential that each trauma center have written protocols defining the clinical criteria and confirmatory tests for the diagnosis of brain death (CD 21 – 3).	Type II

Chapter 22: Verification, Review, & Consultation Program

Chapter 23: Criteria quick Reference Guide